

COAL AGE

Vol. 13

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No. 11

THE MARCH OF JUSTICE

THERE is such a thing as the March of Justice, and it vitally concerns every mining man. A few years ago we were not so much interested in it, for then we did not realize what an important part the coal industry was to play in a world war.

Only a short time ago we had no thought that our best efforts would be required to mine coal to send ships to France loaded with our sons and the products of our toil, for the purpose of preserving justice on earth. Individualism has passed. What happens in the far ends of the earth today is our business, whereas formerly we were quite unconcerned.

We know now that the great triumvirate that will save human freedom is—the miner, the soldier and the ship-builder. If one of these three fail, all other efforts will be useless. The German attempt to enslave Russia has removed the last hope that there is any way out but to conquer by force of blood and iron.

A NATION'S vanity tells it what is honor—a nation's conscience what is justice. Justice, therefore, does not exist in a land where pride has supplanted conscience. The great aim of the mighty march of the coal-mining business is to rid the world of a menace, the like of which was never known before.

The progress of justice has been painfully slow because individuals and companies have refused to believe they could be mired in the holes they dug themselves. Its progress has also been retarded by self-interest. Few men but have at some time stood pat for personal profit, to the exclusion of all other considerations.

MANY employers and employees can recall a series of strikes that lasted just as long as one or the other of the parties was too hard-headed. That was obstructing the march of justice—and the families concerned, the community and the nation all suffered. Many men in their business relations are like the Southern sheriff who got up a crap game among the negroes in order to arrest enough prisoners to make a profit from his business of boarding the inmates of the county jail. Others of us are like Plowden, the lawyer, who gave an opinion to a client concerning an offense, but on

learning that he himself was the wrongdoer said: "The case is altered." All such impede the march of justice.

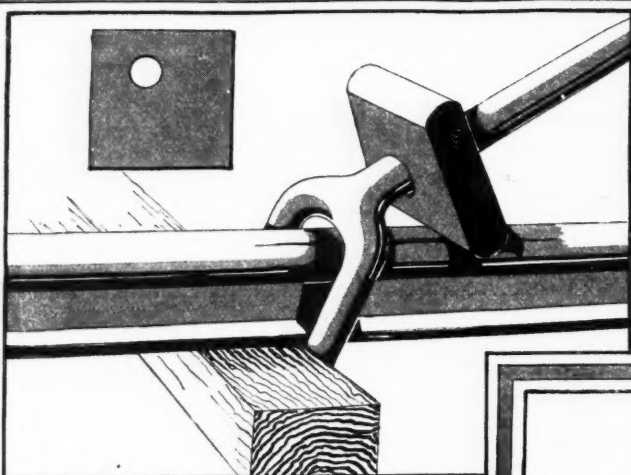
When a virtue is exercised unseen and unsung, it wears its greatest crown. That is why the coal miner in the dark and grime of his underground world has an unmatched opportunity to show character and patriotism. Here he can load clean coal and strike a fatal blow to the Hun, or he can send up slate and render an irreparable injustice to his own countrymen fighting for freedom in France.

IT IS impossible to judge a tree by its bark, a horse by its harness, or wine by the barrel that contains it. The present day of distress and sacrifice is the one time in history to go deep in testing the worth of men and things before judgment is passed. Mine operators must be patient and slow to criticise the men who have been empowered to regulate the industry. It is certain that any mistakes made will be unintentional. Correction will surely follow a persistent presentation of the truth.

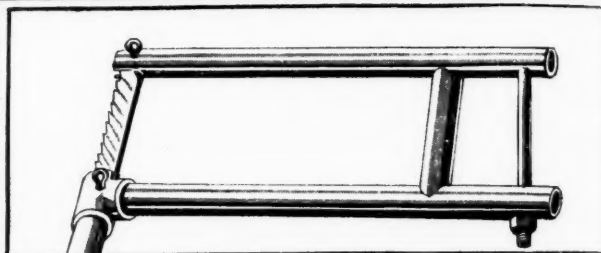
And the fuel administrators—they have the least enviable jobs of all. Nothing is more difficult than the task of catching and chastising the guilty, without also unjustly punishing those who are worthy and decent. A present case in point is the problem of the jobber. Some members of this selling fraternity have done wrong, but there are a lot of decent jobbers whose honesty and patriotism rank second to none, and who have built up businesses legitimately and in absolute conformity with the letter of the law. These men only sell three-eighths of the total coal mined. A slight increase in the ton price of our total output would exceed the commission now paid jobbers for the small part of the total production they handle.

GENERALLY there are several different ways to do the same thing. We must be careful today to see that each new plan we put into effect is better than the old system it supplants. That must be the cardinal aim of the Fuel Administration, the coal operator and the coal miner. Furthermore, let us not forget that "every man loves justice at another man's expense; nobody cares for it at his own."

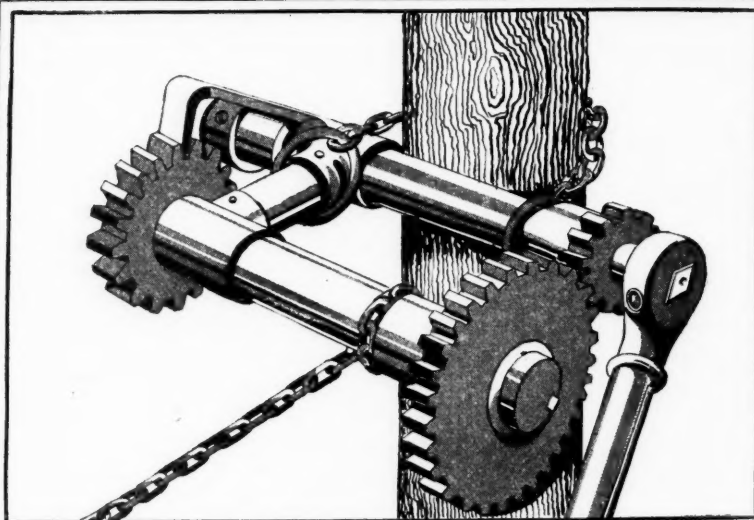
IDEAS AND SUGGESTIONS



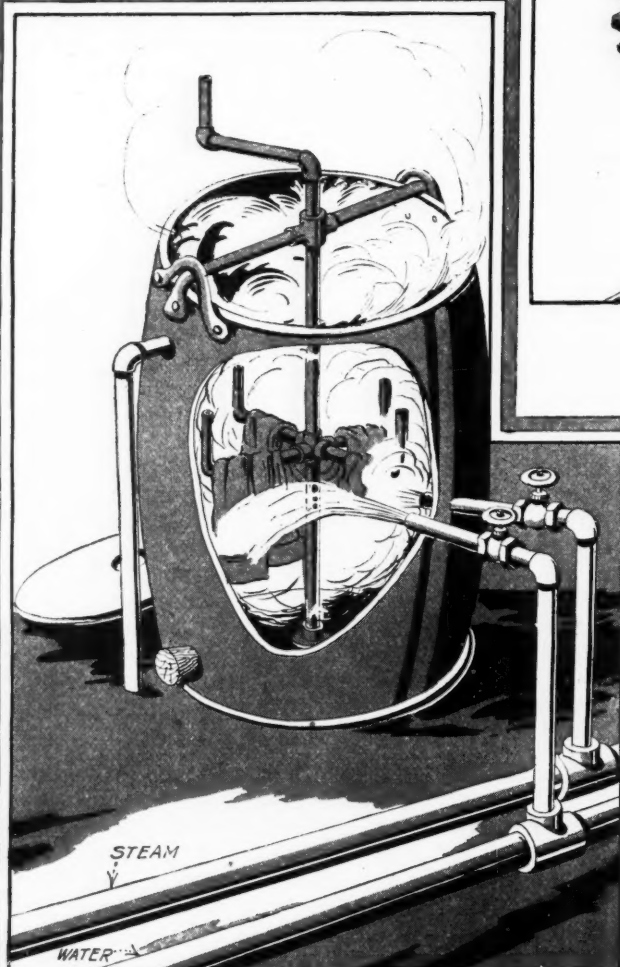
THE BLOCK ADJUSTS THE CINCH
BAR TO ANY TIE RAIL



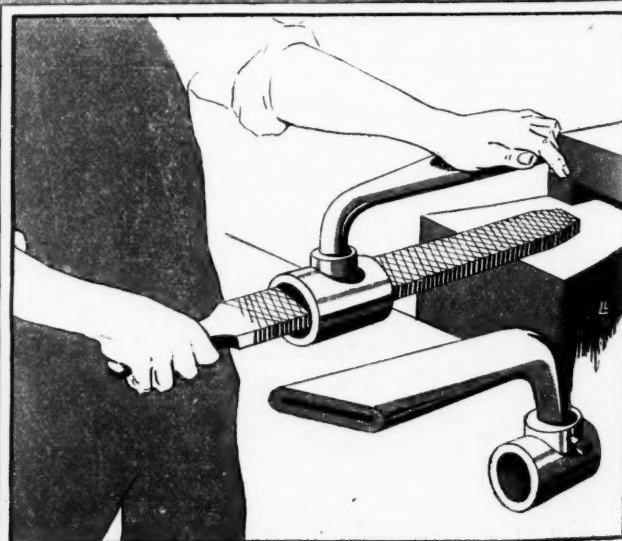
PLENTY OF CLEARANCE
SPACE HERE



HOME-MADE TIMBER PULLER

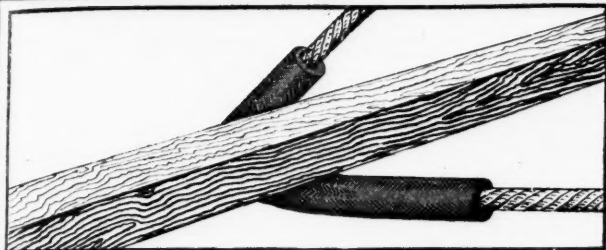


A DISCARDED WATER BARREL SERVES WELL
AS AN OVERALLS WASHER

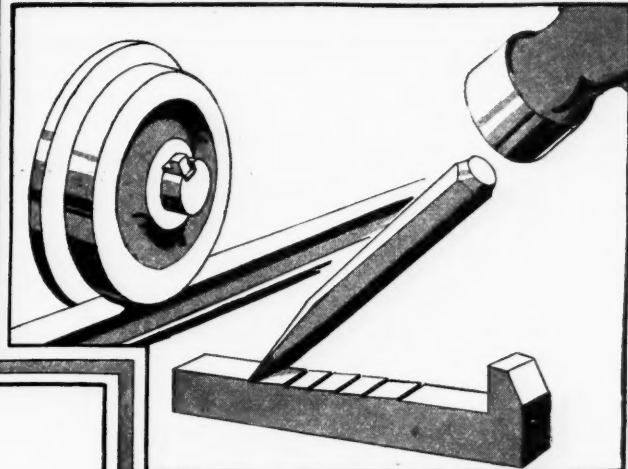


THIS MAKES FILING
MORE EFFECTIVE

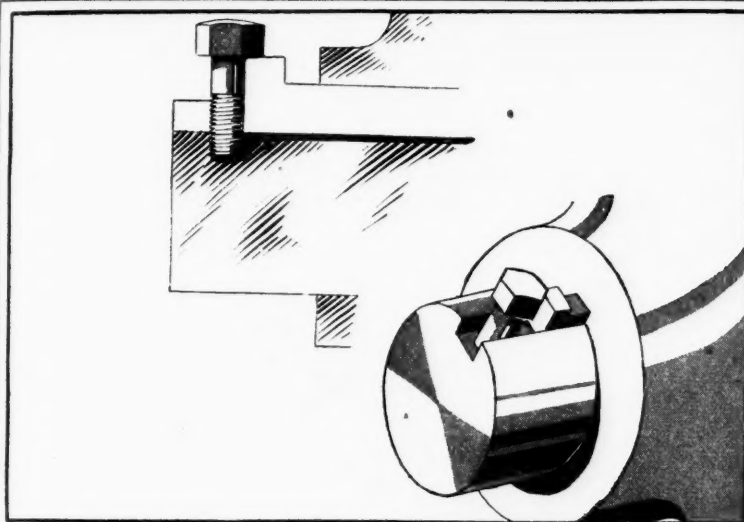
FOR USE AROUND THE MINE



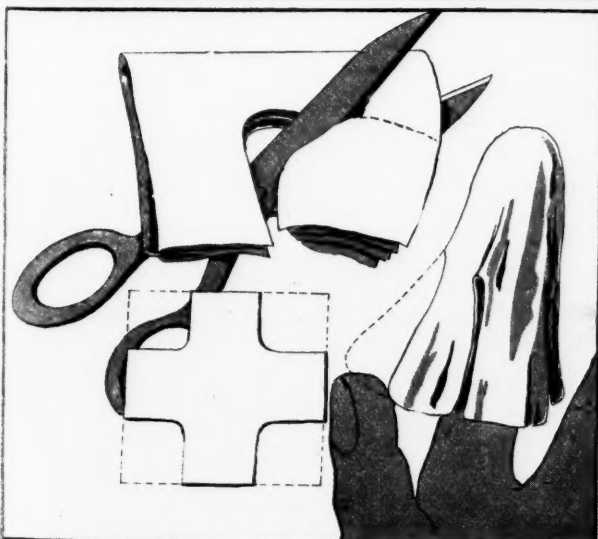
DISCARDED AIR HOSE CAN BE USED TO
SAVE THE ROPE



THAT KEY WILL NEVER FALL
OUT AGAIN



YOU CAN USE A SCREW TO HOLD A KEY IN PLACE



A NEAT BANDAGE PATTERN FOR
SORE FINGERS



AN EXTENSION THAT WILL
NOT WOBBLE

The Mineral Spring Breaker

BY DEVER C. ASHMEAD

Tarrytown, N. Y.

SYNOPSIS—*Description of grounds and construction of building. Wet treatment of coal from egg to pea sizes in jigs. Operation of an interesting barney plane.*

EXCELLENT in design, construction and management, the Mineral Spring breaker of the Lehigh Valley Coal Co., at Wilkes-Barre, Penn., is a credit to the city from an architectural point of view, instead of being an eyesore, as is the case with a number of other breakers in the anthracite region. The grounds of the colliery are fenced in with about $3\frac{1}{2}$ miles of board fencing, painted red, the entire fence being surmounted by barbed wire.

The ground immediately surrounding the breaker and the main plant has been laid out as a park and is always kept in fine condition, favorably comparing in this respect with many city parks. The old slate dumps have been terraced and covered with a layer of good soil to a depth of one foot in which grass seed has been

sown; and a well-kept lawn greets the visitor as he enters the main gate (see Fig. 1).

For the main walks concrete has been used, while the minor pathways are of cinders, the borders along the walks being correctly trimmed. On each side of the walk, and extending from the main gate to the top of the hill, is a line of shade trees. These trees do not appear in any of the illustrations to this article, as they were only planted last fall. Flower beds are laid out, adding considerably to the beauty of the grounds. A glimpse of the flower beds may be obtained in Figs. 3, 4 and 5.

In Fig. 6, which is a general view of the plant, it will be observed that the grounds about the main shafts and buildings are covered with cinders. The entire place is kept scrupulously clean, not so much as a scrap of paper being visible. No broken cars or parts of machinery are in sight, the company officials evidently being firm believers in "a place for everything and everything in its place."

The men at the plant are responsible for the appearance of the grounds, the company furnishing the neces-

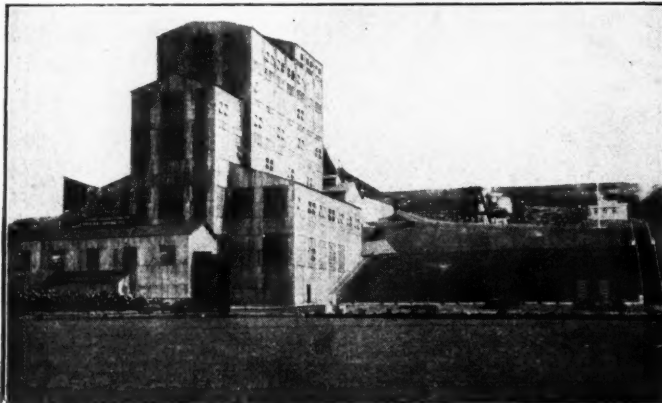


FIG. 1. SHOWING TREES AND WELL-KEPT GROUNDS

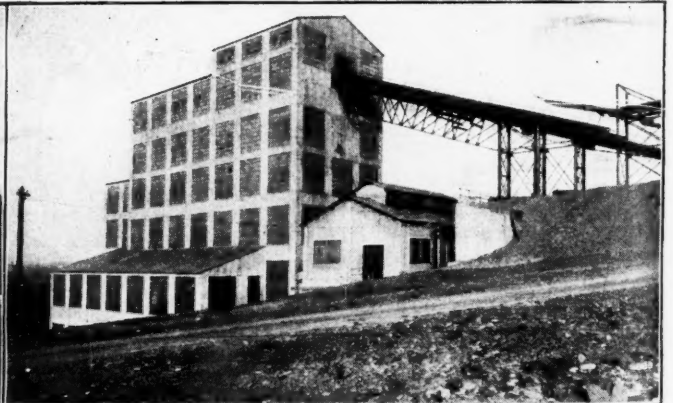


FIG. 2. SIDE VIEW OF MINERAL SPRING BREAKER

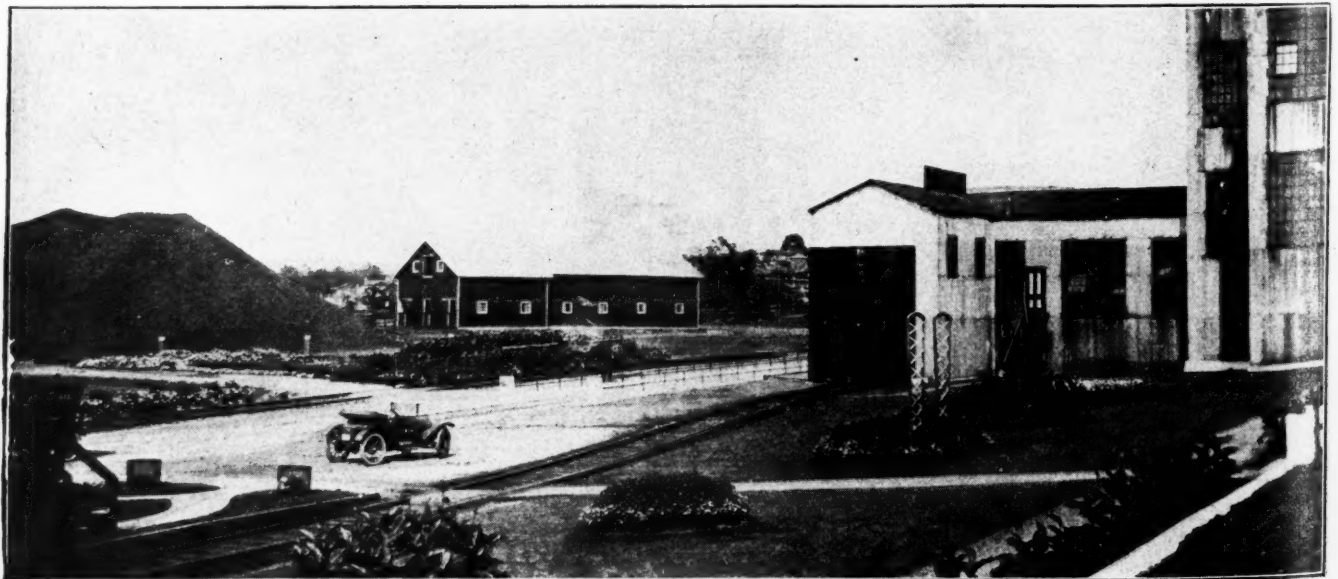


FIG. 3. VIEW OF THE LAWN AND FLOWER BEDS IN THE VICINITY OF THE LOADING HOUSE

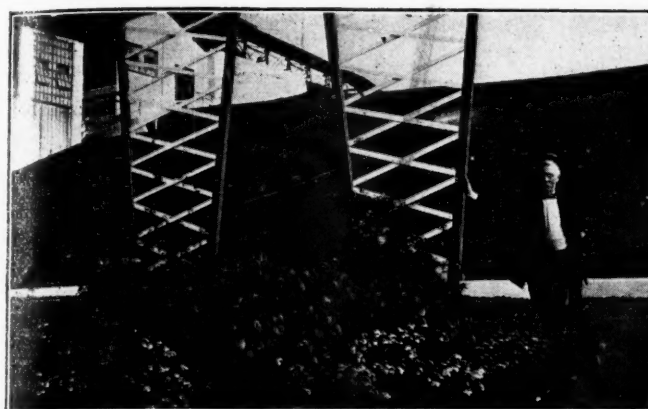


FIG. 4. ONE OF THE MANY FLOWER BEDS

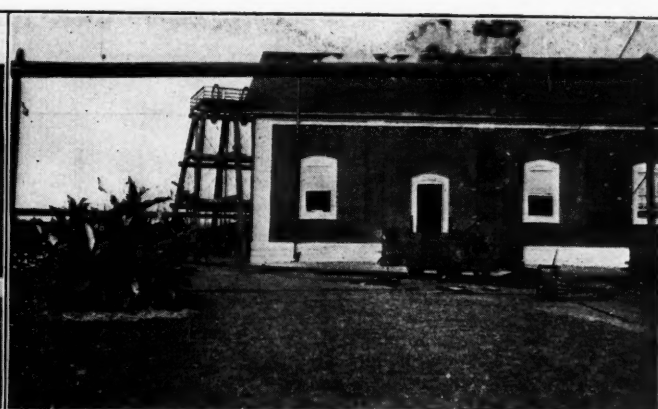


FIG. 5. VIEW NEAR THE BOILER HOUSE

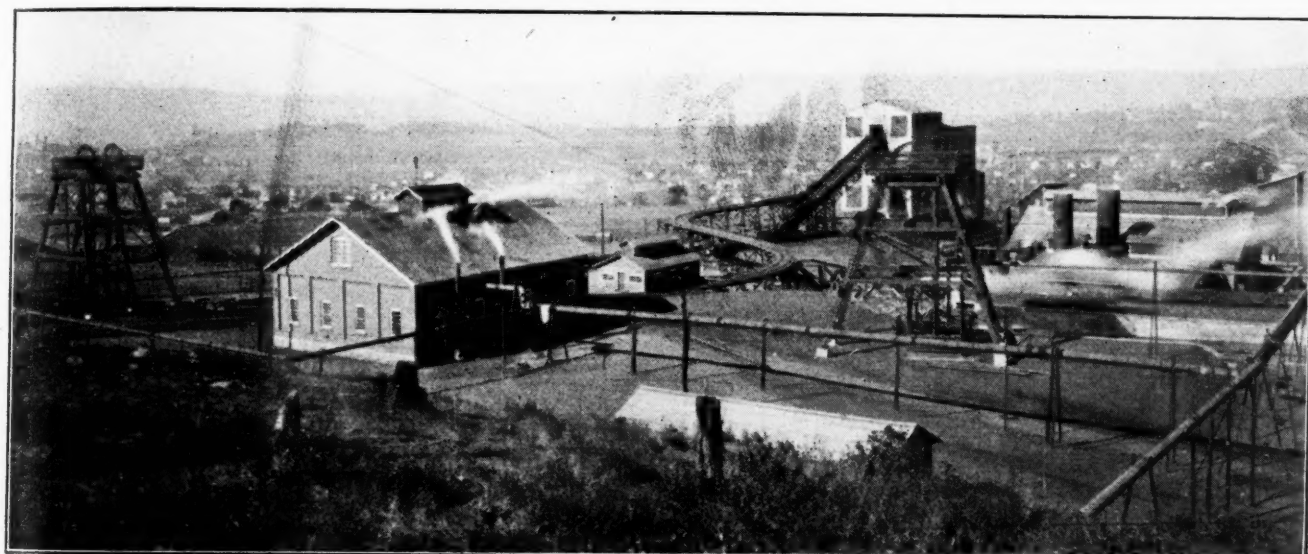


FIG. 6. GENERAL VIEW OF THE SURFACE PLANT

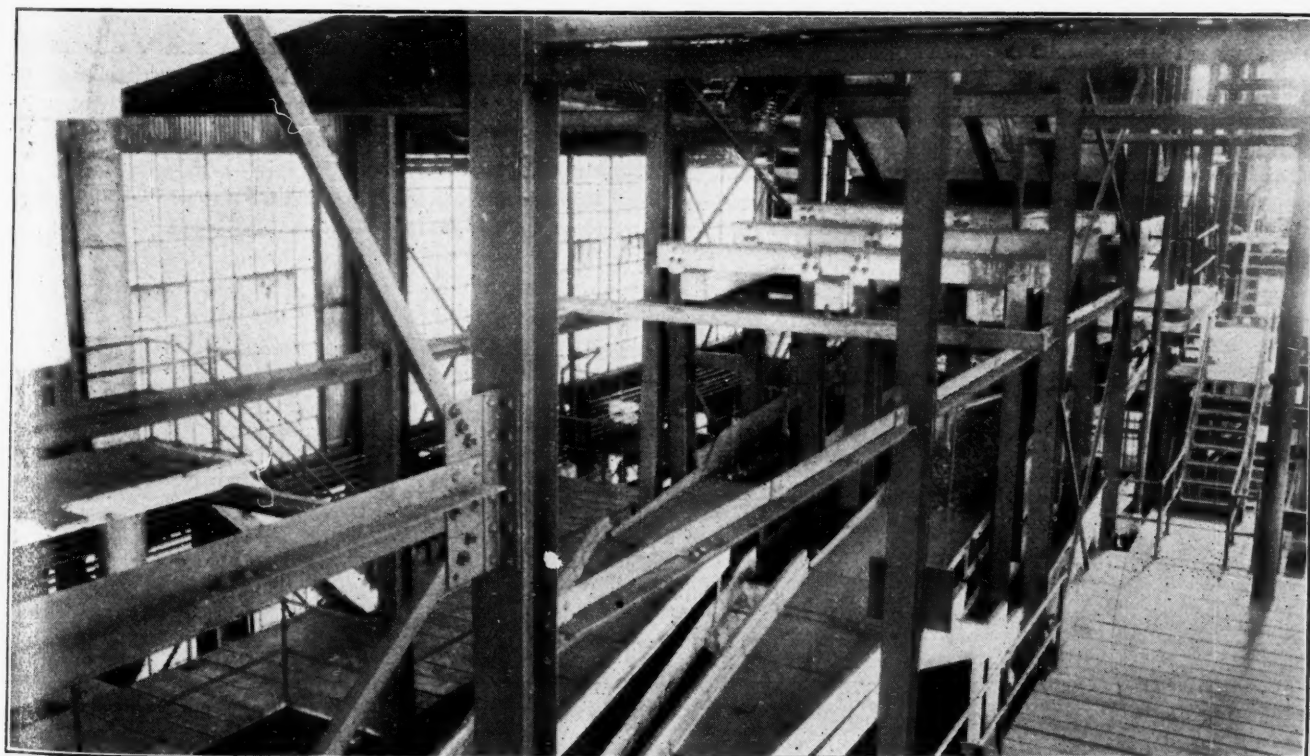


FIG. 7. INTERIOR OF BREAKER, SHOWING SHAKERS AND CHUTES TO THE JIGS

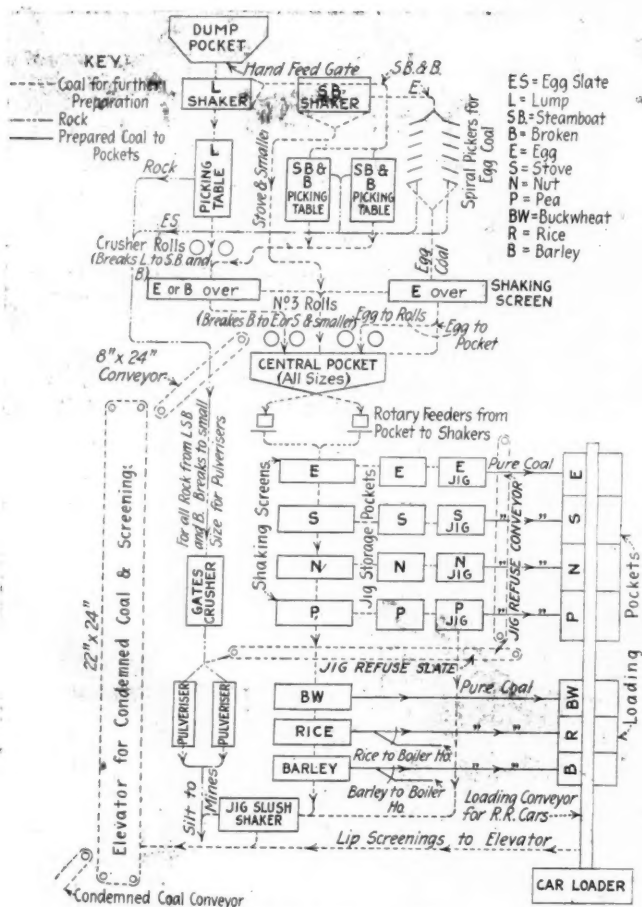


FIG. 8. FLOW SHEET

sary materials and tools and the employees are paid for the time they give to the work. That this arrangement has resulted to the satisfaction of all is evidenced by the fact that the efficiency flag which the company presents yearly to the colliery with the best-kept plant has been won four years in succession by the Mineral Spring plant.

The breaker is of steel construction and is roofed and sided with galvanized corrugated sheet iron and steel sash with ribbed glass. The glass area amounts to about 75 per cent. of the total sides of the structure, affording plenty of light. The building is heated by exhaust steam to a temperature of 60 degrees with an

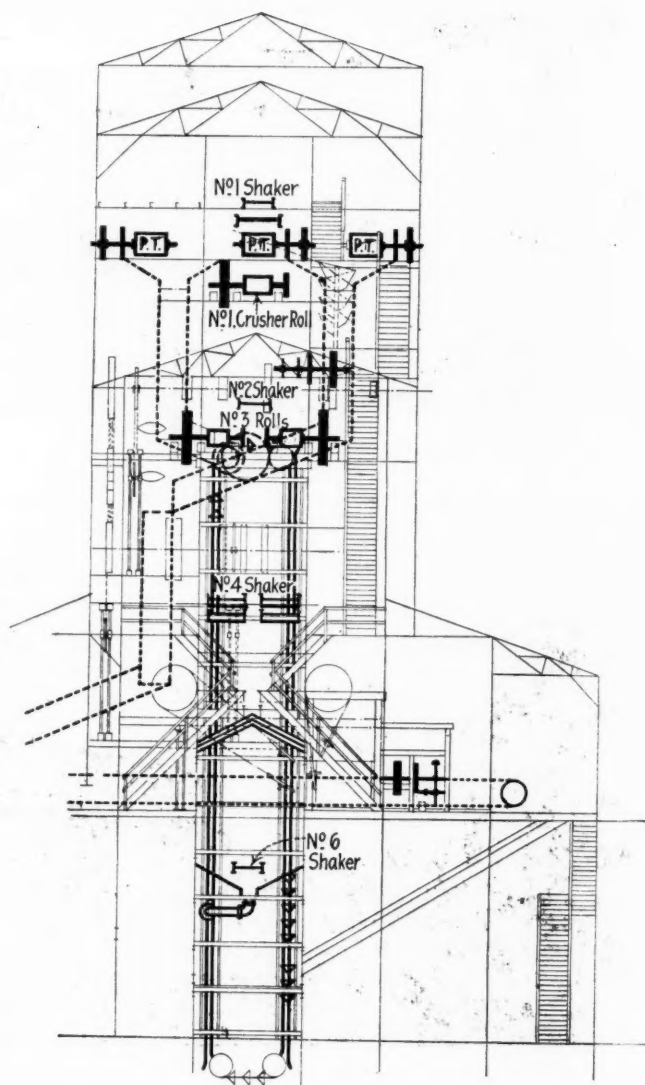


FIG. 9. CROSS-SECTION OF BREAKER (WIDTH)

exterior temperature of 0 degrees F. and is a comfortable place in which to work. It is also vital to the successful operation of the breaker, which has all wet preparation. If there were no heat the water would freeze during cold weather.

Figs. 1 and 2 afford two excellent views of the breaker

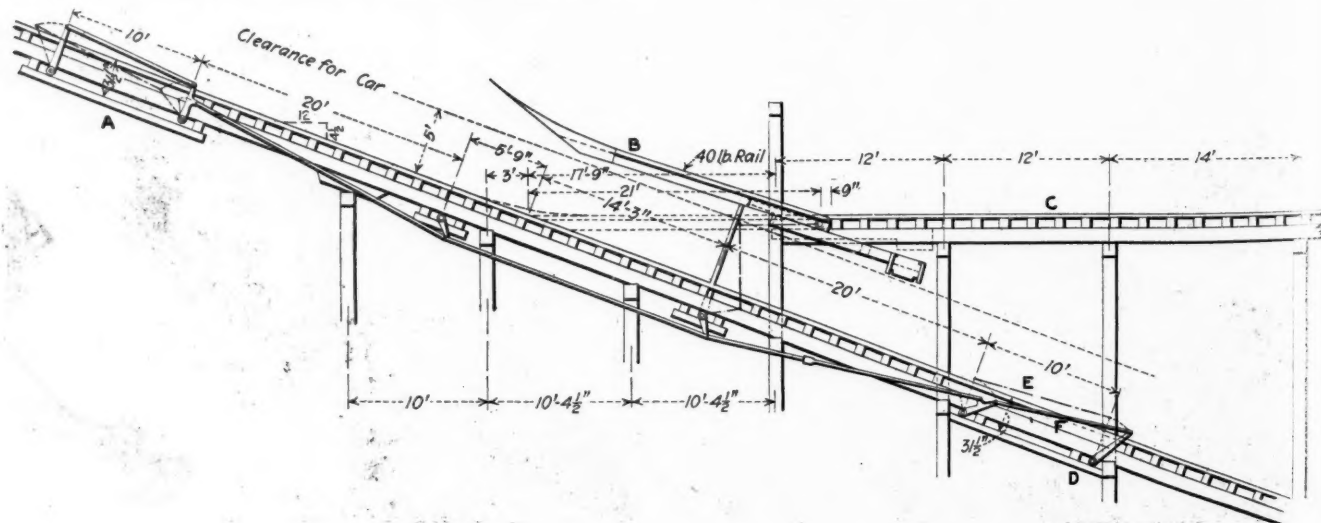


FIG. 10. DIAGRAM ILLUSTRATING OPERATION OF BRIDGE ON BARNEY PLANE

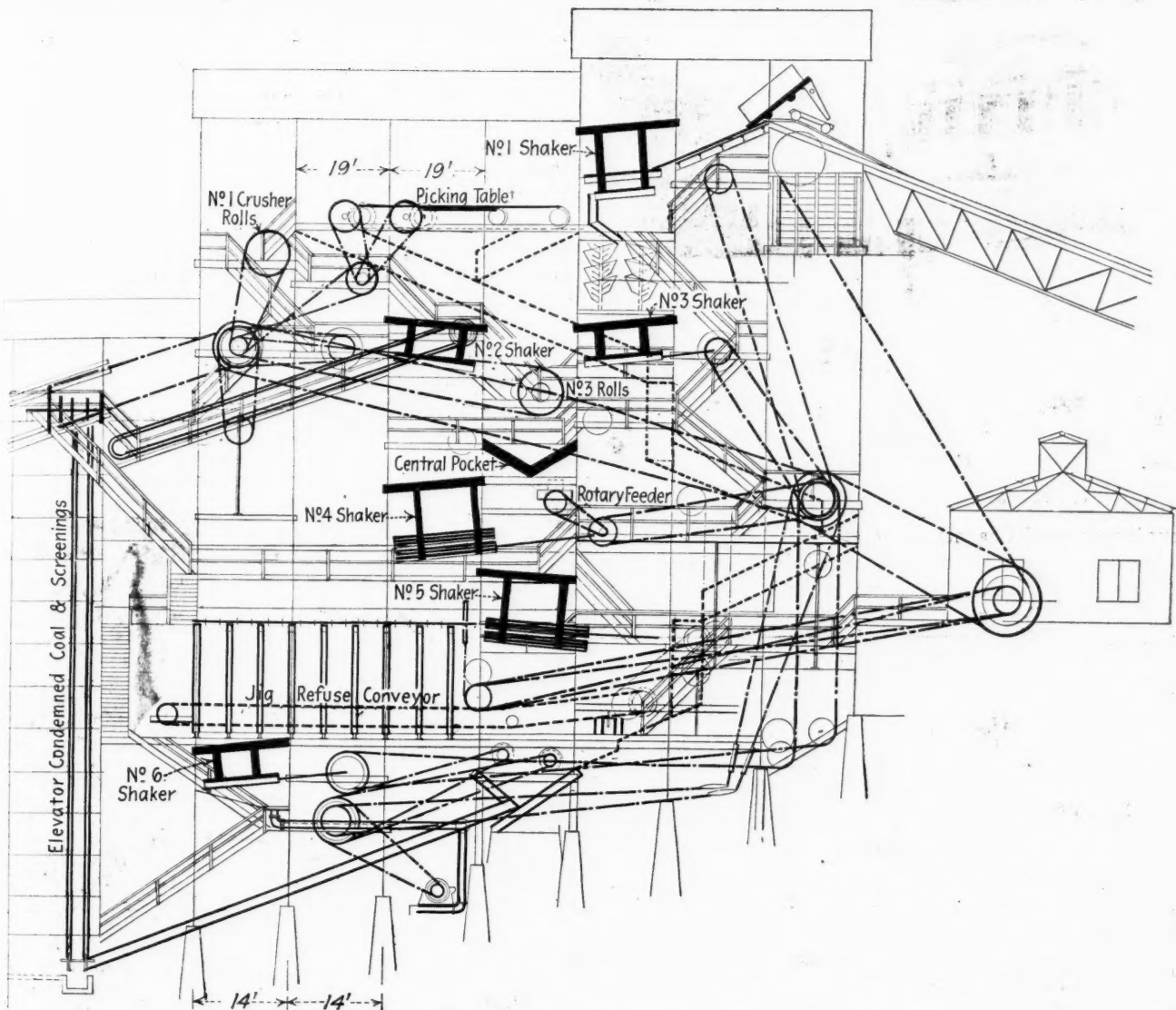


FIG. 11. ANOTHER CROSS-SECTION OF THE MINERAL SPRING BREAKER

and illustrate in particular the large area of glass surface. Fig. 3 shows the front end of the breaker and the housing over the loading track machinery.

The coal treated in the breaker is brought from the shaft shown at the extreme left of Fig. 6, and from a slope just off the edge of Fig. 6 on the right (not illustrated). The production from both shaft and slope is approximately 1400 tons a day. The shaft is about 400 ft. and the slope 600 ft. distant from the breaker. In a short time additional coal will be hauled by locomotive from a tunnel about 3 miles from the breaker. When this is done the maximum capacity of the breaker—1600

tons a day—will be reached. The shaft shown in the center of Fig. 6 is the manshaft. The mine cars from the hoisting shaft and the slope are run by gravity to the foot of the barney plane, which is illustrated in Fig. 2.

The control of these cars is excellent. No brakes are employed, nor is it necessary to use sprags, as there are two car retarders on each track which are controlled by a man at the foot of the plane.

When a loaded car is released from the last car retarder it runs to the foot of the barney plane and over the barney pit. The engineer in charge of the barney

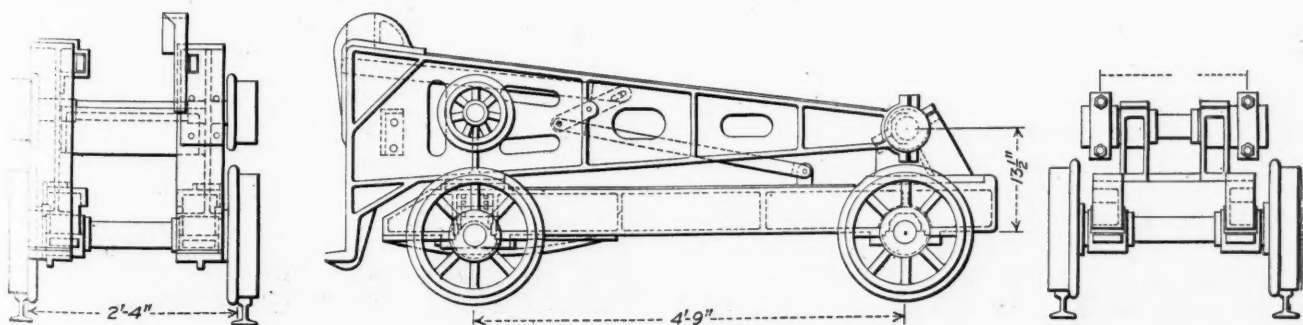


FIG. 12. DIAGRAM ILLUSTRATING CONSTRUCTION OF BARNEY USED AT PLANT

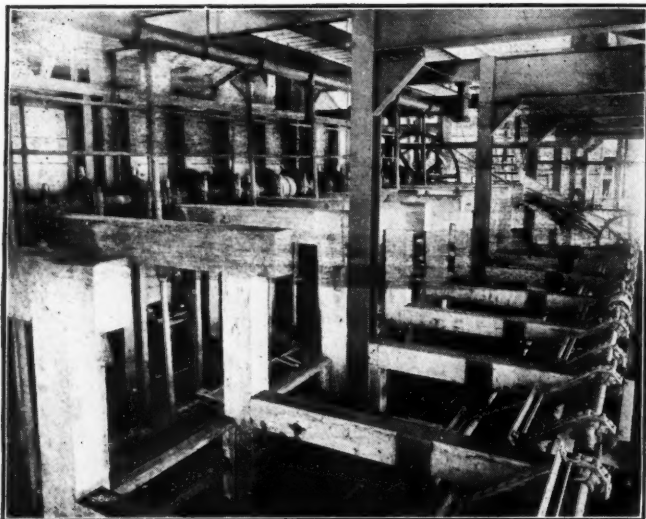
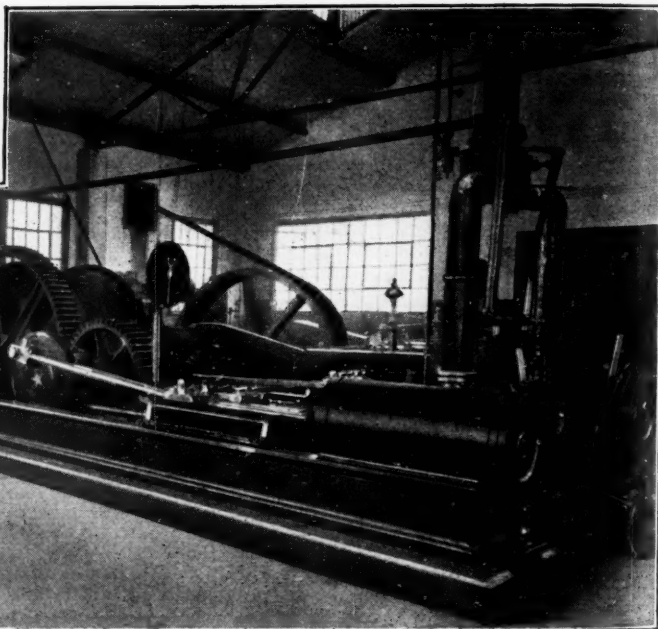
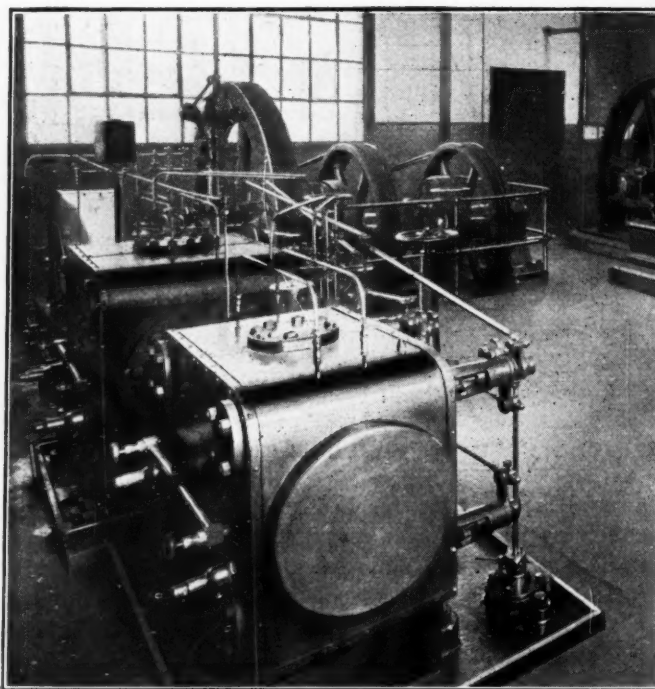


FIG. 13. JIGS FOR TREATING THE COAL

engine starts the barney (Fig. 12) and the upper part, which acts on a hinge, lifts, due to arrangement of the track in the pit. The upper part of the barney

FIG. 14. VIEW OF ENGINE ROOM
Showing jig engine, barney plane hoisting engine and breaker drive engine, all built by Vulcan Iron Works

catches the end of the mine car and pushes it up the plane. As soon as the barney comes out of the pit, the track on which the lower wheels rest rises until the hinge is closed.

On reaching the point shown at A in Fig. 10, the car engages a trip and the bridge B lowers. The mine car goes to the top of the plane, where it is automatically dumped, as shown in Fig. 11. Returning to the bridge B, Fig. 10, the car runs over the bridge onto the empty track C, the barney passing between the tracks of the bridge and returning to the barney pit. Before reaching this pit, however, the barney engages with the trip at D, which is then in the position E, and troughs it to the position F. This opens the bridge at B to allow the next loaded car to pass up the plane.

From the mine car the coal passes to the No. 1 shaker, which has two decks. The coal that leaves the

mine car is thoroughly wet. The lump coal passes over the top deck of the No. 1 shaker, which has a 6-in. perforated screen, and also over the lump picking tables and the larger pieces of rock are thrown out. Then the lump goes to the No. 1 rolls, where it is crushed. The coal which passes over the second deck of the No. 1 shaker goes to picking tables on the top floor and from this it is mixed with the coal from the No. 1 rolls. All this coal goes to the No. 2 shaker, which has one deck, and all coal larger than egg passes over the shaker and goes to No. 3 rolls, where it is broken to egg and smaller. The top floor of the breaker is shown in Fig. 15.

Coal passing through the second deck of the No. 1 shaker goes to chutes which carry it to the No. 3 shaker, where, if desired, the egg can be run through the No. 3 rolls; or else all the coal passes to the central pocket, as does also the coal from the No. 3 rolls.

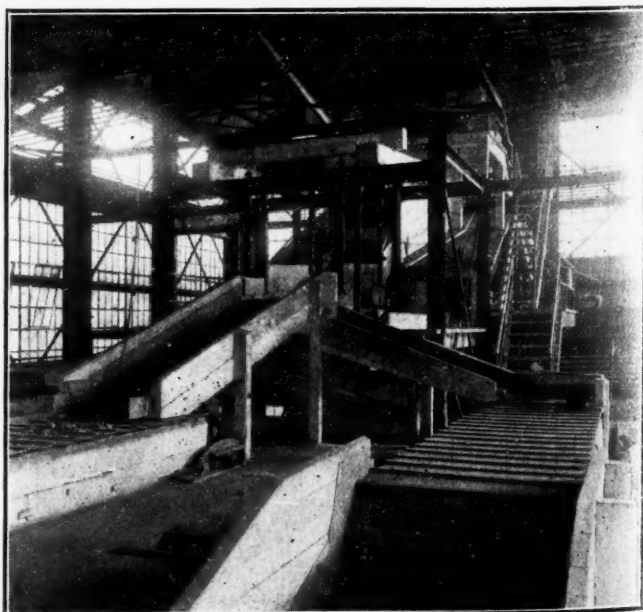


FIG. 15. HEAD SHAKERS AND PICKING BANDS

From the central pocket the coal is fed by rotary feeders to the No. 4 shaker, which is a four-deck affair. The egg coal is taken off the top deck and sent to the jig storage pockets by means of chutes. The coal from the second deck is stove, from the third deck nut, from the fourth pea, all of which goes to their proper jig-storage pockets by means of chutes. The central coal pocket and the shakers with their chutes are very well shown in Fig. 16.

From the jig pockets the coal is fed to the jigs and the refuse separated, the pure coal going to the main storage pockets. The main jig floor of the breaker is shown in Fig. 16. This illustration also shows the jig refuse conveyor. Fig. 13 is a view of the jigs from

shaker goes to the elevator for screening, being conveyed back to the central coal pocket for re-treatment.

All the rock collected from the picking tables on the top floor of the breaker goes by means of chutes to a crusher, and from here, together with the slate from the jig refuse conveyor, it passes to two pulverizers, where it is pulverized and then sent down into the mine for filling.

The arrangement of the loading pockets is different from that in most breakers, as the pockets are arranged at right angles to the railroad track rather than parallel to it. The coal from these pockets is discharged onto a belt conveyor which is 36 in. wide and 145 ft. centers. The discharge end of this belt conveyor is arranged so

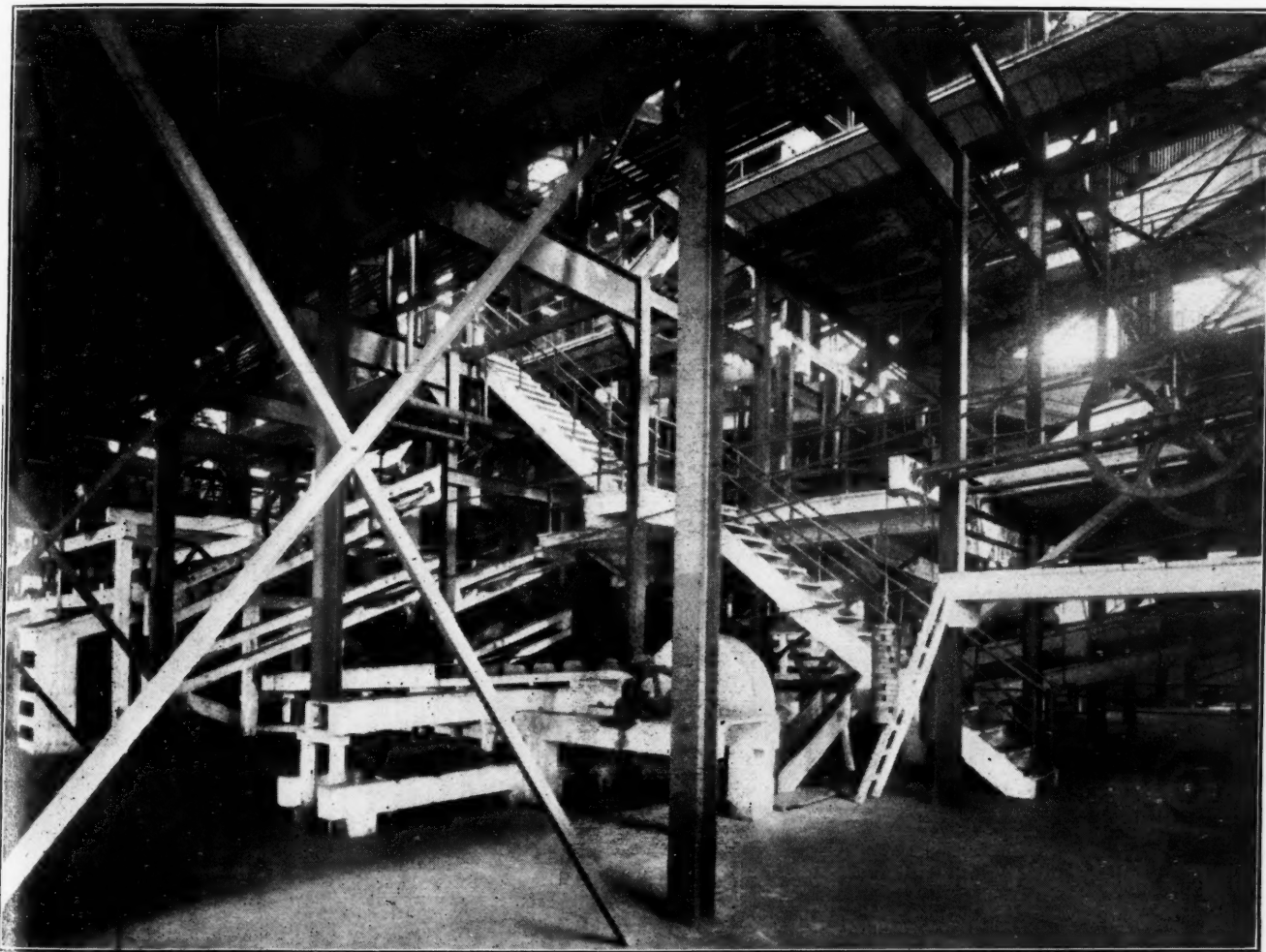


FIG. 16. INTERIOR VIEW OF BREAKER, SHOWING JIGS AND JIG REFUSE CONVEYORS

above. These jigs are of the Lehigh Valley Coal Co.'s plunger type.

The coal that passes through the lower deck of the No. 4 shaker goes to the No. 5 shaker, which can be seen in Fig. 16. This shaker has three decks, separating buckwheat, rice and barley coal, each of which goes direct to its respective storage pocket. The rice and the barley coal can also be sent to the boiler house by means of a drag conveyor, which can be discerned in Fig. 6 between the breaker and the boiler house.

The slush from the jigs and what passes through the No. 5 shaker is run over a No. 6 shaker. The silt goes to the mines and what passes over the No. 6

that it can be raised or lowered to discharge at the proper height into the railroad cars. One lever opens gates for the same kind of coal on each side of the conveyor, there being seven levers in all. The Lehigh Valley Coal Co. has installed an Ottumwa box car loader, which enables the loading of box cars when other types of equipment cannot be obtained.

If any of the coal already loaded into railroad cars is condemned as not being up to standard, it is dumped into a pocket and carried to the foot of an elevator by means of a conveyor, the elevator taking the coal up to the central coal pocket for re-treatment.

The breaker engine house is a separate building in

the rear of the breaker and under the barney plane. This is shown in Fig. 2 and also in the cross-section, Fig. 11. The engine house contains a Vulcan 16 x 30-in. duplex hoisting engine, which operates the barney plane. A Vulcan 11 x 16 x 24-in. tandem compound engine drives the jig machinery. A Vulcan 17 x 26 x 30-in. breaker cross-compound engine drives the breaker machinery. The jig engine has a double rope belt, while the engine that drives the breaker machinery has a 24-in. belt. Fig. 14 is a view of the interior of the engine house.

Only 27 men are employed around the breaker, making an average of 60 tons of coal a day per man employed, or 80 tons of coal a day per man employed inside the breaker. The men employed and their positions are as follows: One on the barney plane; one man in the engine house; one man tends to the dumping of mine cars at the top; two men are on the picking table floor; one man tends to the elevators; one man looks after the shakers; one man is the breaker oiler; eight men tend to the jigs under a jig boss; two men pick all the slate from the egg coal after it leaves the jigs; one man tends to the breaker machinery and there is one slusher; one man operates all the loading machinery, including box-car loader; five men are on the outside to handle the railroad cars.

Smokeless Boiler Furnaces

The Bureau of Mines, Department of the Interior, after several years of experiments in fuel combustion in a special furnace, makes the announcement that from the results it is possible to design a furnace with considerably more assurance as to its capabilities than has heretofore been possible.

Starting with the analysis of the coal to be used and the rate at which it is to be burned, the furnace dimensions in feet and inches can be designed with a reasonable assurance of obtaining a desired degree of completeness of combustion.

The bureau has just made a report on this subject, Bulletin 135, "Combustion of Coal and Design of Furnaces," by Henry Kreisinger, C. E. Augustine and F. K. Ovitiz. The publication marks a period in work approved in 1906 by a National Advisory Board appointed by the President to advise the Government concerning fuels. The bureau proposed to conduct such experiments as would make it possible to design fuel-burning furnaces on a rational basis rather than by the cut-and-try methods of the past.

The process carried on in the combustion space is influenced by many factors, the most important of which are the volume and shape of the combustion space; the kind of coal used, especially the character and amount of volatile matter it contains; the rate of firing; the quantity of air supplied over the fuel bed; the rate of mixing the air with the combustible rising from the fuel bed; the rate of heating the coal; and the temperature in the combustion space.

The qualitative effects on the rate and completeness of combustion of many of these factors have been known for a long time; but the quantitative data, presented in definite units of seconds, pounds, feet or percentages, have been lacking. To obtain such definite information a study of combustion in the space beyond the fuel bed

was undertaken, and the results of extensive tests are given in this bulletin. About 100 elaborate tests were conducted in a special furnace using three kinds of coal—Pocahontas, Pittsburgh and Illinois—and at rates of combustion covering the full range found in practice. These are believed to be the most extensive tests of the kind ever undertaken.

While the bulletin is especially for those interested in the design or reconstruction of fuel-burning furnaces, it contains much of interest to the general engineer interested in fuel problems. Some of the statements sure to arrest the attention of the interested engineer are as follows:

The size of the combustion space required appears to be directly proportional to the percentage of oxygen in the moisture-free and ash-free coal.

The percentage of excess air that gives the best results varies with the size of the furnace and the kind of fuel. This fact explains why in one plant the highest efficiency may be obtained with 14 per cent. of CO₂ in the gases, and in another plant with only 10 per cent. of CO₂.

There is a definite relation for each coal between the excess air supply and the percentage of CO₂ in the furnace gases.

Soot is formed at the surface of the fuel bed by heating the hydrocarbons in absence of air. It is not formed by the hydrocarbon gases striking the cooling surfaces of the boiler. As a matter of fact only a small trace of the hydrocarbon gases ever reaches the surface of the boiler. Hydrocarbons that do so are prevented from decomposition by the cooling effect of the contact. The cooling surfaces do not cause the formation of soot; they merely collect soot and prevent its combustion.

It seems that most mechanical stokers are smokeless not because they burn the smoke, but because they burn the coal in such a way that little soot or smoke is produced. Hand-fired furnaces are smoky because soot is produced in or near the fuel bed, and can not be burned in the limited combustion space of the furnace.

Copies of this publication may be obtained free of charge by addressing the Director of the Bureau of Mines, Washington, D. C.

Bud's Boss

BY CHARLES L. FAY

Sociological Superintendent, Davis Coal and Coke Co.,
Cumberland, Md.

*I like a boss who is bigger than me,
With a head made fer thinkin' an' eyes that can see.
I want him jest common, but with that somethin' there
That tells you he's bigger an' right on th' square.*

*I want a boss who knows how to say "No!"
Th' sort of a man that makes everything go,
Th' side-steppin' boss, who allus gives in,
Jest gets me nowhere—he's weak as his grin.*

*I want a boss who can show where I'm wrong,
An' point out my failin's so I can get strong.
Why should his salary be big as it be,
If he cannot show plainly he's bigger than me?*

*I want a boss that I can respect;
A man on his job, who will never neglect
To tell me my faults or give praise when I win it;
That kind of a boss gets my best every minute.*

*I'm climbin' life's ladder th' best that I can,
With th' patience an' pluck of a red-blooded man;
An' d'you know, sir, to me 'twill be a big loss
When I can't make a teacher out of my boss.*

Cement Gun in Mining Work—I*

By GEORGE S. RICE

Chief mining engineer, Bureau of Mines, Pittsburgh, Penn.

SYNOPSIS—A partial history of the early use of concrete and cement grout in mines and of the introduction of the cement gun. Its use in the experimental mine. A description of the gun and its manner of operation and an account of the results obtained in tests of the gunite.

THE use underground of hydraulic cement, and the scope of its uses increased almost as rapidly as in surface construction. One of the early underground applications was for the filling of the cavities behind the linings of tunnels, this being accomplished by pumping cement grout into the open spaces. In France in later years the "cementation process" of impregnating broken water-bearing ground by forcing in cement under high pressure was successfully employed, revolutionizing the method of shaft sinking through water-bearing chinks and marls in the north of France and Belgium. The employment of concrete for making massive linings of shafts and tunnels in place of timber framing and brick arching has been very extensive. The development of thinner, reinforced lining came into use later. In 1906 I water-proofed the air shaft of a mine in central Illinois by placing a thin but reinforced concrete lining, rectangular in section, inside a wood cribbing. The shaft passed through water-bearing ground.

About 1907 one of the large colliery companies of northern France, Mines de Béthune, began, in a new colliery, the use of a light, reinforced-concrete lining for all its cross-strata tunnels. When I visited this colliery in 1908, two miles of this lining had been constructed. It was only 5 or 6 in. thick, and the mixture was lean. Moreover the reinforcement was so very light that the cement work seemed to be hardly more than self-supporting and probably bore little of the weight of the encompassing strata. In other words, it apparently served merely to protect the strata from weathering.

The lining served its purpose satisfactorily as I found out when I again inspected it three years later (1911), by which time more lining had been built. On the other hand timbered tunnels in the same formation had given much trouble. This demonstration convinced me that the important factor was to protect the strata from the action of the air. The cost of the lining in the Béthune mine was relatively low under the conditions then prevailing in France, only \$5 per lineal yard, which figure would have to be doubled if an estimate were to be made of the cost of such lining in this country, even prior to the war. The general method of lining seems an admirable one, although the first cost was considerable, but, in the long run, it should be economical because it eliminates the cost

of timbering and of cleaning up of falls of roof inseparable from the maintenance of a roadway and it also serves as a protection for the men against injury from roof and rib falls.

Concluding that the protection of the natural roof and ribs against weathering, a process for which oxidation is principally responsible, was probably the important factor in preventing subsequent falls, I studied the problem carefully in the hope of determining what sort of inexpensive coating might be applied to a shale roof to prevent its coming in contact with the air currents with the hope of thereby saving expensive work later on and furthermore of lessening accidents from falls.

In many mines, when the mine entries are first driven, the top or bony coal roof seems admirable. It appears as if it would stand forever; but in a year or even less the weathering action begins, falls occur and timbering and retimbering follow. Finally you find the roof has dropped until the entry is twice as high as it was originally, and more or less filled with timber. When this condition has to be met it involves a great annual expense for the maintenance of the roads, and should a fire start there is plenty of fuel to feed it. Also the timbers provide places for the lodgment of the dangerous coal dust which floats in the air. In this manner timbering increases the explosion hazard.

In 1910, when I saw the cement gun exhibited at the convention of the National Association of Cement Users, held in New York, I thought that here was an apparatus that would furnish the agency I sought for the placing of a more or less impervious coating on the mine walls. I made reference to its availability for that purpose in an address on concrete in mining (which appeared in the transactions of the 7th convention in 1911). After showing how much safer was a smooth, concrete lining as compared with timbering, I made the following statement which appears to be as true now as then:

"The apparatus for applying cement mortar by means of compressed air, commonly known as the 'Cement Gun,' offers great possibilities for the lining of passageways, etc., with cement. By protecting from weathering the roof and walls of a passageway with a thin coating of cement, it is possible that the heavy expense of timbering in many cases may be avoided. The machine also offers possibilities of use in the fireproofing of timber and board stoppings and in the erection of firewalls in places difficult of access, since the material can be pumped for a considerable distance."

For many years grout has been pumped into cavities behind tunnel and shaft linings. However, G. L. Prentiss, in a paper given at the meeting of the cement users above referred to, on the "Use of Compressed Air in Handling Mortars and Concrete," stated that compressed air was first used for the transporting agent in placing concrete and mortar in France, for the repairing of tunnels on the Paris-Lyons-Mediterranean Ry., France. This was in 1906. The linings of

*Paper read before the Coal Mining Institute of America at its Pittsburgh, Penn., meeting, Dec. 6, 1917, and entitled "Weather-proofing Mine Roof and Walls and Making Tight Stoppings with Cement Gun."

the tunnels were leaking and the arches were thereby becoming weakened. The engineers attacked the problem by using a machine consisting of a charging hopper connected with a pressure tank, into which air was forced by a compressor at a pressure of 40 to 50 lb. per sq.in. The tank was first charged with a grout composed of cement, sand and water, and after the pressure had been put on the material was forced out through a line of flexible hose to a discharge nozzle, which was applied to holes drilled through the arch of the tunnel. It is stated the results from an engineering standpoint were satisfactory, but the machine gave trouble, as it and the hose became clogged with grout, and the process was therefore tedious and expensive.

Various other attempts were made to use compressed air for blowing cement or concrete mixtures through pipes, and according to Mr. Prentiss, J. W. Buzzell and W. H. Larkin, in 1909, undertook work in this country

as 1910. The method was used for applying stucco and cement-sand mixtures, thus it was used for coating a frame building with stucco. Brick walls and fences were by this means covered with stucco or cement. He also instanced its use in the construction of the General Cement Products Co.'s buildings; the coating of structural steel, with and without the addition of reinforcing wire mesh; the fireproofing of the interior of wood-lined buildings; the building up of sections of cement pipe from a wire-mesh skeleton; the use for tree surgery; and the very important application of lining the iron syphons in the water supply system of New York. These syphons were 11 ft. 3 in. in diameter, and the total length to be treated was nearly 14,000 feet.

In that same 1910 meeting there was some talk of using the cement gun in mines, but it was with the idea of pumping concrete or cement into an excavation and filling it solid. In this manner it was suggested that a



FIG. 1. THE MACHINE BEHIND THE GUN



FIG. 2. THE MAN BEHIND THE GUN

of that nature. They found that they could force a mixed concrete through a 4-in. pipe a distance of 400 ft. with a pressure of 40 to 50 lb. per sq.in., a higher pressure than this not being found advantageous.

The predecessor of the cement gun appears to be the long-used spraying device employed for the painting and whitewashing of rough work, like railroad freight cars. Here the paint or whitewash is ejected from a nozzle by means of compressed air. Nevertheless, this method like those previously described used the compressed air to transport the grouting, concrete, or whitewash in liquid mixture, whereas the cement gun operates on a different principle; namely, to transport the cement and sand dry, wetting it only at the nozzle. It is not, of course, possible to employ crushed stone in the mixture, which must be composed of cement and sand only.

As the cement gun is a patented machine, I feel it is necessary to explain that I have never had any financial interest in it, and that I am concerned in it only as a means of obtaining a certain practical result in the mines.

Mr. Prentiss described in the paper, to which I have just referred, a variety of applications of compressed air to the placing of cement mixtures, some as early

deposit of cement mortar might be placed which would later serve as a pillar. Men not familiar with mining thought that as concrete was so much stronger in compression than coal, no coal pillars would be required, if much smaller concrete pillars were substituted. Manifestly with the ordinary roof or floor the concrete blocks would be pushed into the roof or floor before the full strength of the concrete was developed, or else the roof spanning the excavated area would fail. So far as known, this futile project was never tried.

After seeing the demonstration of the gun in the exhibition of 1910, and the way the cement coating, sometimes termed "gunite," would stick to steel and stone, I concluded that here was a machine which offered a means of applying a thin cement coating to the roof and ribs of an entry or tunnel before weathering took place.

When the experimental mine of the United States Bureau of Mines, located near Bruceton, Penn., had been fully developed for its purposes, a cement gun was loaned in 1914 to the bureau by the Cement Gun Co., for trial applications. The manufacturers at that time, not having turned their attention to its mining possibilities, could not be induced to lend the gun without considerable negotiation. It was found, after ex-

perience had been gained in handling the gun, that a cement-sand covering, varying from a thin coating to one several inches thick, as desired, could be placed without difficulty on the coal ribs. It would even stick to the "draw slate" or clay band. Moreover, a thin to a $\frac{3}{4}$ -in. coating could be made to stick to the roof without the use of wire mesh.

It was also found to be of great advantage in making stoppings practically air-tight. In October, 1914, when the American Institute of Mining Engineers met at Pittsburgh, an exhibit was given at the mine of the use of the cement gun for these purposes. The cement-sand lining has been extended in the mine entries from time to time until now nearly 1000 lin.ft. of entry has been thus lined, the roof coating being from $\frac{1}{4}$ to $\frac{3}{4}$ in. thick and the rib covering from 1 to 2 in. thick.

These coatings have been found very successful in the prevention of weathering on the sides and roof. It is true that from time to time repairs have had to be made on the roof coating, but this, in part at least, seems to have been due to the effect of the violent explosions produced in our experiments, of which over three hundred have been conducted. After many of these the coating would shell off the roof in patches, particularly where a void had developed behind the coating. These voids, or spaces, are caused by the concrete shell pulling away from the main roof where it is shaly, taking some scale with it. The concussion or rush of the explosive blast later knocks off the shell.

GUNITE WITHSTOOD ALL EXCEPT EXPLOSIONS

In offsets, where the work is protected from the explosions, the coating has rarely come off. As a result of these experiments it was thought that if the coating was well put on, particularly when the roof was fresh and sound, it would stick tight for a long period under ordinary mine conditions. Since the conditions at the experimental mine were abnormal, the failures in patches of the roof cannot be considered to condemn the system and there has been no trouble whatsoever from the coating on the ribs and draw-slate. This is most important, as those who have operated in the Pittsburgh beds well know. Usually disintegration which leads to falls in the roof come about through draw-slate over the coal softening, thereby widening the roof span. Then the roof falls and the widening and cutting back goes on, making the timbering more and more expensive.

These tests at the experimental mine were brought to the attention of leading mining men, and this caused some of them to try experiments of their own. Trial of the method was made slowly at first, but the representatives of the bureau constantly urged further experiments as the change seemed to promise increased safety as a result of better lighting, the reduction of falls and the danger of coal dust explosion propagation. Now the development is proceeding more rapidly.

Fortunately the cement gun can be used for other purposes than to prevent the weathering of the mine roof. For example, it can be used in the fireproofing of wooden stoppings, the sealing off tightly of fires, something which much appealed to the metal mining companies, operating large bodies of rich sulphide ores which are prone to spontaneous combustion in stopes.

The cement gun is also most useful wherever iron or steel beams or posts are employed underground or in shafts as it prevents the metal from rusting.

An excellent description of the cement gun was presented by Carl Weber in a paper before the Western Society of Engineers of Mar. 9, 1914. It described the gun as it appeared in earlier stages of its development. A good description also appeared in *Engineering* (London) for June, 1916. These articles show the remarkably wide adaptability of the cement gun to other uses than those already mentioned, such as the repairing of concrete walls in subways, the rehabilitation of retaining walls, the lining of reservoirs, the repairing of street-car tunnels and the lining of coal bunkers.

The cement gun (see outline drawing) consists of two hoppers, an upper and a lower one, the upper one being the receiving hopper for the mixture of sand and cement. This mixture is made on the ground and shoveled into the hopper in a dry state. The receiver has a cone stopper in the top and one for the discharge of material from the bottom, thus the feeding material is "air locked" into the lower hopper which is

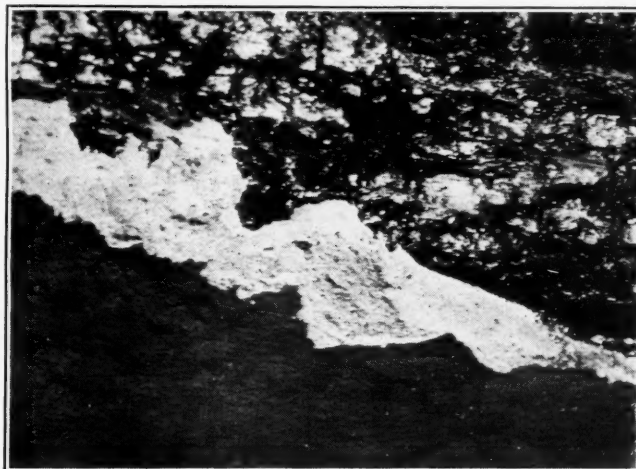


FIG. 3. SHOWING THE GUNITE PICKED DOWN
The gunite adheres closely to the coal surface

under air pressure of from 20 to 50 lb. In the bottom of this hopper there is a feeding wheel, which is turned mechanically. As it revolves, it delivers the right quantity of cement material opposite the outlet. Here the pressure of the air in the lower hopper forces the measured material out. As the dry mixture is forced into the flexible hose, additional air is injected and this aids in carrying the material onward to the nozzle. The hose may be of considerable length—50 or 100 ft. or even more. At the end of the discharge tube there is a nozzle where water is supplied at a pressure about 20 lb. per sq.in. higher than the pressure of the air. This is delivered in such a manner that it immediately mixes with the sand and cement. The nozzle is handled like a water hose and pointed approximately at right angles to the wall or surface to be covered. The sand is mixed with the cement in proportion of 3 to 1, but about 20 to 25 per cent. of the sand, after impinging on the wall, drops to the floor so that the coating put on is about $2\frac{1}{2}$ to 1. The surplus sand can be shoveled up and used again. It is surprisingly clean.

The wheel is turned by a worm which is driven by a small air motor. The compressed air and the water under pressure are usually furnished by the mine plant,

but if the mine is not equipped it would be necessary to have a portable compressor and also a pump with a supply of water for the operation of the cement gun.

A cross section of the machine is shown in Figs. 4, 5 and 6. A and B are cone valves operated by control lever C and D. E is the air-supply valve. The air-supply hose is connected at F. G is the supply cock for the air motor; H, an air pipe, controlled by cock A. The main air-supply pipe to the lower main hopper is controlled by the cock K. L is discharge tube of the machine and it is shown in Fig. 5 at M.

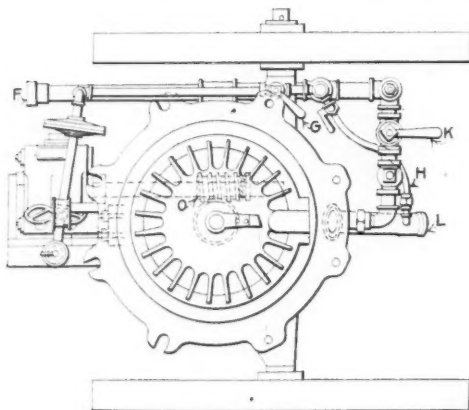


FIG. 4

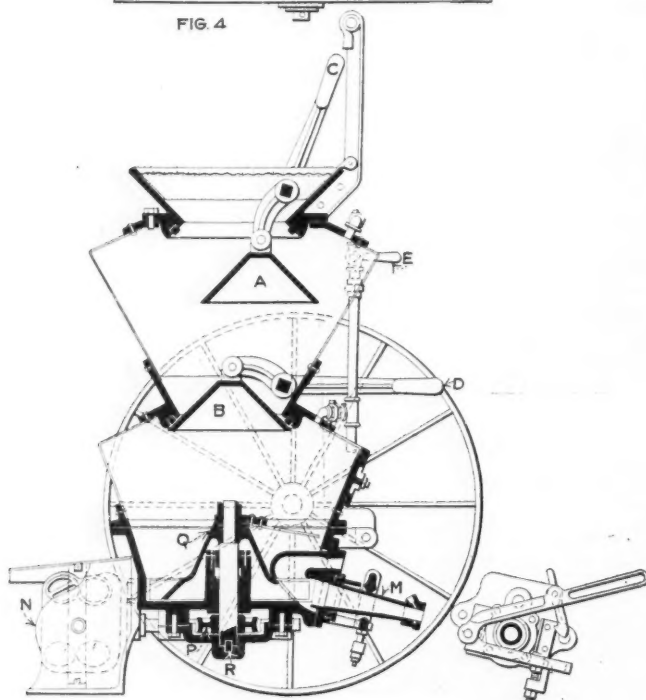


FIG. 5

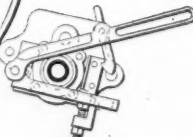


FIG. 6

FIGS. 4, 5 AND 6. SECTIONAL PLAN, SECTIONAL ELEVATION AND DETAIL OF PINCHING LEVER

The tube is flexible and may be throttled by the pinching action of a lever shown in the small detail drawing, Fig. 6. N is the air motor and O, a worm, driving through gear P, the feed wheel Q. R is the footstep of the vertical shaft of the rotating wheel. It is to be noted that the discharge tube L is of rubber and the hose is rubber lined, there being no metal exposed to the sand blast except a little at the nozzle.

According to Mr. Weber, the sand-cement material leaves the nozzle with a velocity of about 300 ft. per second. In striking a hard surface the sand rebounds and falls down, only the neat cement adhering until

a coat is formed thick enough to hold the sand. Then the rebound lessens and the coat is built up until the desired thickness has been obtained. The tightness by which the sand-cement coating is placed by this method is of great value. A report was made by Westinghouse, Church, Kerr & Co., testing engineers, which was quoted at length in the paper just referred to. It bears testimony to the quality of the cement-sand coating produced by the cement gun. Their conclusions were:

In all of the tests made the products of the cement gun were shown to be superior to good hand-made products of the same kind. The degree of superiority varied between wide limits.

In tensile strength the gun work excelled hand work in every case by amounts ranging from 20 to 260 per cent.

In compressive strength the excellence of the gun work was even more marked, ranging from 20 to 720 per cent. better than hand work.

In the matter of surface permeability the gun work absorbed from 7-10 down to 1-20 as much water per hour, per unit of area as the similar hand-made surfaces.

As regards absorption of water, the hand-made mortars took up from 1.4 to 5.3 times as much as the gun-made mortars.

The percentage of voids of the gun-made product ranged from 52 to 75 per cent. of that in the hand-made product.

The adhesion of the gun-applied mortars was on an average of 27 per cent. better than that of the hand work.

I will not attempt to take up at length the many uses other than those already cited, for which the method may be employed, except to quote from Mr. Weber's paper that a large reinforced-concrete power house with a chimney 150 ft. high was coated with a thin gunite coating, the chimney receiving the same coating as that used on the building, thus providing a uniform finish for the entire structure. There was no difficulty experienced in shooting up the sand-cement mixture through the hose to the nozzle in working on the high chimney, with the gun standing on the ground level.

The foregoing description refers to a specific machine. There are other machines which are said to accomplish similar results, one called the "Concrete Atomizer." These machines use a different principle, forcing out a wet or liquid mixture with steam or compressed air. A concrete atomizer was employed, in 1914, on the Delaware, Lackawanna, & Western R.R., in the repair of honey-combed and cracked concrete piers, girders, beams and slabs. No doubt there are other workable machines, but I have only had experience with the cement gun. It is presumable that there be a great variety of forms which might meet the needs of the mining industry, but the essential requirement for that service is the delivery of the mixture under considerable pressure through a nozzle with a flexible hose which may be over 100 ft. long if desired.

(To be continued)

BLIND LUCK

IT may be true that some men are fated to reach enviable positions in life. There are those who will tell you that if the stars were scattered about the heavens in some mystic, lucky way when you were born you're bound to get there—regardless. It may be true. But you can be sure that the chap who thumbs his nose at horoscopes and pitches in to carve a niche for himself way up on top is going to beat your "lucky" fellow who waits for his dreams to come true. The Annual Success Number of "Coal Age" will contain a number of articles about men who are carving niches in the coal-mining world. Perhaps you, too, know of someone whose story should be told—of some man who has left his impress on the coal-mining industry of your district by successful methods, successful management, or the successful adaptation of machinery. If so, tell us the story of the man or his methods, and send us the article by Mar. 25, accompanied by the necessary photographs or drawings.

Mining Engineers Consider Industrial Relations—III

BY R. DAWSON HALL
Associate Editor, "Coal Age"

SYNOPSIS—*The American Institute of Mining Engineers discusses the losses sustained by employer and employee from the preventable sickness of the latter. Addresses are made on the abnormal workman and on the percentage of accidents resulting from human fallibility, the greenhorn and the chance-taker.*

AS has been said it was the session on employment problems which attracted the most general and most favorable consideration. The session held the day before had been dominated by no less a person than Hudson Maxim—whose fame would probably not be enhanced even by saying that he is a member of the Naval Consulting Board, for the members of that Board are all more distinguished in themselves than even in their association.

Nevertheless, Hudson Maxim did not seem to create the interest that was aroused by Dr. Thomas Darlington, formerly commissioner of health of New York City and now secretary of the welfare committee of the American Iron and Steel Institute and consulting surgeon to the American International Shipbuilding Corporation. The remarks of Dr. Darlington in briefing his paper were eloquent and forcible.

In fact, cold type taken from the paper itself can hardly convey any idea of the strength of his presentation. Moreover, he added extensively to the material presented in the paper to cover some matters in industrial hygiene which do not look well in print. After saying that compulsory health insurance may introduce an interest in the employees' health such as compensation laws have already introduced in regard to safety, he adds in his paper:

GAIN TO INDUSTRY IN STEADY, HEALTHY WORKMAN

"Illness in industry already has an effect on operating costs that is far from being generally realized. When a man is absent from his work because of illness it is usually necessary to have someone else take his place.

"The substitute, as a rule, is a less efficient workman; he makes a smaller output for the day's wages, he spoils more raw material, he requires more supervision from the foreman, who is thus distracted from more important work. Moreover, procuring and sending the substitute to the work needed involves a cost and usually a delay in the operations.

"When labor is abundant, it is customary to maintain a working force that is at times larger than is actually necessary, in order to avoid interruption of operations when men fail to report for work at the usual time. It is evident that this adds to cost, and now that labor is generally so scarce that industry is unable to maintain a reserve supply this cost is represented by loss of efficiency in plant operation.

"The illness of the workman is not, therefore, a matter which concerns himself only, but is a source of direct loss to his employer. The cost of health supervision is relatively not large, as is shown by a comparison of the cost of health supervision in 99 industrial establishments, employing altogether 495,544 men, made recently by M. W. Alexander, for the Conference Board of Physicians in Industrial Practice.

"The figures vary rather widely, since some plants reported only the medical cost, while the majority included the cost of clerical assistants and even of janitor and scrubwomen. The average cost per man per year for the half million employees was \$2.50, or about 3c. per day. Two of the companies not only give medical and surgical attention to injured employees, but furnish all the medical attention required for the families of workmen, as well as for the men themselves. In the case of an iron- and coal-mining company employing 11,000 men, the cost of giving all the medical attention required for the men and their families amounted to \$11.82 per man per year or less than 4c. per man per day."

CONFLICT OF HUMAN NEEDS WITH ECONOMIC LAW

The remarks of Dr. Darlington bear forcibly on a subject that we will all have to consider more definitely in the future than in the past—the opportunity and ability of the workingman for steady employment. The workman needs pay enough to compensate him for the time in which he has to be idle. The need for such pay is quite obvious, but it is equally obvious that, as his pay is derived from production, he cannot be paid for his idle hours. The workman will eternally wrangle from the point of view of his needs; the employer will equally tenaciously argue from the law of nature that the ration of the world in the average is the quotient of persons producing into product produced.

The argument brings us nowhere. The need of the workman is insatiable, and the economic law which the employer advances is likewise inexorable. The immovable mass has met the infinite force. But in a degree we can sidestep the whole matter. When we do away with the idle days by promoting good health and industrial continuity we increase product and so meet the workman's needs. It is true, however, that eventually—yes, in less than a generation—the needs of the workmen will grow till they equate themselves to the earnings and then a new source of betterment must be sought. That source we must find in greater industrial efficiency during the working period which is the outcome of machinery and industrial education.

Dr. Darlington is a warm advocate of the garden as a corrective of many of our social ills. In this connection he says:

"Of distinct economic value has been the encouragement given by employers to those living in industrial or mining villages by fencing in plots for gardens, assisting

when necessary in plowing and fertilization, and stimulating the employees and encouraging them in thrift and industry by offering prizes for the gardens. These gardens reduce the cost of living—some yielding vegetables enough for the family and also a surplus for sale—and they promote health by bringing members of the family into the fresh air and sunshine.

"They mean cleaner yards and better care of drainage and waste, thus preventing odors and the breeding of flies and mosquitoes. They provide a greater variety of food, and this is good for many workmen eat too much meat, and an excess of flesh diet is not conducive to the best work, growth or health. They tend to the abolition or the confining of domestic animals. They promote morality, keep the owner from the saloon and advance his own self-respect. They help to make homes and have a refining influence on the family."

After brief remarks from Dr. L. A. Shoudy, the paper was supplemented by a talk by Dr. E. E. Southard who spoke on the "Psychopathic Employee." Dr. Southard directs a psychopathic institute in Boston, and he has made a careful study of persons who are on the borderland of insanity. He was able, therefore, to discuss most interestingly the abnormal mentality of moody and simple-minded employees.

In the afternoon he presented a resolution that met with ready response calling on the board of directors of the institute to appoint a committee to study with a similar committee of the National Committee on Hygiene, if such should be appointed, the problems of employment in relation to mental disease and deficiency, said committee to report as a joint committee to the two organizations a year from date.

PART OF HUMAN FALLIBILITY IN MINE ACCIDENT

The first paper of the session was, however, that of Herbert M. Wilson, the point most insisted on being that the "human element" in accidents is the leading cause of their occurrence. Unfortunately there is no denying that fact. It was realizing it which held back compensation so many years and that made the courts construe the laws as they did as regards contributory negligence. It is for this cause largely that we tend to keep down compensation to a percentage rate of earnings.

Still it is to be questioned whether 40 per cent. of all accidents occur under conditions which could not have been avoided had the employer used every possible safeguard. Some concerns like the United States Coal and Coke Co. may be able to prove the blame for 40 per cent. or even two-thirds of the accidents is on the human element, but it is hard to believe that at the general run of plants of the 40 per cent. of accidents attributed to the human element not one of them is attributable in part, not perhaps to contributory negligence of the employer, but to the lack of his contributory defense against the accident. Mr. Wilson remarked:

"In connection with the inspection of mines for the fixing of merit-premium rates for insurance under workmen's compensation, it has been the practice of the Associated Companies to allow 60 per cent. of the credits for the safeguarding of the physical hazards of the mine and 40 per cent. for the human element. By 'human element' is meant that inherent tendency of the industrial worker to be careless, negligent or disobedient, in respect to his own safety, and after that also of his

fellow workman. This is a tendency not only of the laborer or of the skilled miner, but of all human beings, working or traveling anywhere.

"This element of mine safety, sometimes called the moral hazard, has been admirably shown by statistics compiled from the records of the Department of Mines of the Union of South Africa to be due in about equal measure to the carelessness of the miner and to that of the operator. These statistics show that about one-half of the fatalities in mines are due to the so-called hazard of the industry, or what is sometimes called the dangers inherent to work or misadventure.

OPERATOR AND MINER ALMOST EQUALLY TO BLAME

"Of 2497 fatalities investigated, including over 200,000 employees, for a period of over 2½ years, it was found that 17.5 per cent. were due to faulty plant or material, fault of foreman, or of management—in short were due to the operator; 17.1 per cent. to disobedience of orders, carelessness or ignorance of injured persons; and 5.9 per cent. through fault of others, including fellow workmen.

"The fault of the operator is evidenced by failure to give proper warning, failure to inspect, failure to furnish proper equipment, and neglecting to comply with the recommendations of the inspector. That education and training of the mine operator as well as of the mine worker is essential to any material improvement in the safety of mining is beyond question, and the system of schedule-rating insurance premiums under workmen's compensation which has been adopted by the Associated Companies takes cognizance of this to the fullest possible extent.

"While The Associated Companies has accepted 40 per cent. as a reasonable measure of the proportion of accidents due to the human element, a careful study of accident causes in the last two years for over 2000 mines has convinced me that the human element is responsible for a much larger percentage of accidents. J. S. Herbert, Superintendent of the Safety Department of the Cambria Steel Co., says that the statistics of that company convince him that 93 per cent. of its accidents have had no relation to mechanical defects, and that 73 per cent. of their injuries are chargeable to the man himself or one of several causes, usually carelessness, indifference, or recklessness."

ACCIDENTS TO GREENHORNS AND CHANCE-TAKERS

Of course the usual discussion followed as to the relative proneness of the greenhorn and the hardened chance-taker of years of experience to get injured and killed. The problem is so far quite far from solution. But the experiences of some companies have been tabulated, and in a few years they will cover a sufficient length of time and a sufficient number of instances to make their publication advisable. B. F. Tillson, E. E. Bach and C. W. Goodale were among those entering into this discussion.

Few companies ask their men on employment how long their experience has been and, if they did, the answers they might get would be far from truthful. Every man would try to show that his experience would qualify him as a competent miner. But figures are needed badly so that the operator can order his safety work accordingly.

(To be concluded)

Importance of Proper Robbing Methods

By J. T. MORRIS

Superintendent, E. E. White Coal Co., Statesbury, W. Va.

SYNOPSIS—*The advantages of systematic mining in the first stage are appreciated by all operating companies, and systematic mining in the second stage should be observed by all. Mining methods today are nearing the goal to a 100 per cent. recovery, and the robbing of pillars, or second mining, should receive the earnest attention of all mine foremen, assistant foremen, pillar bosses and contractors.*

THIS article is not a criticism on any method of robbing, nor on the inefficiency of persons connected with the direct production of coal from the working places, but is more or less in the nature of advice to the latter—and to some men "higher up" who are held responsible for the operating company's "goods in stock," which is coal.

To the average foreman, the term "pillars" usually implies a few cars of coal coming from a certain section or sections of a mine that require little attention on his part. The sooner these are loaded out the better, he considers; and when the fall comes his inefficiency is hid forever. How many tons of coal has gone to waste in a stump here and a stump there!

But this is not the view that should be taken of pillars. These should receive more of the foreman's attention than any other part of his work, for statistics show that practically three-fifths of all accidents in normal mining comes from falls of roof, slate and coal. We have more falls on the pillars than elsewhere. In addition large feeders are liberated by these falls in pillar work in a gaseous seam, and more material is lost in robbing than in first mining.

QUESTION OF PILLARS ONE OF IMPORTANCE

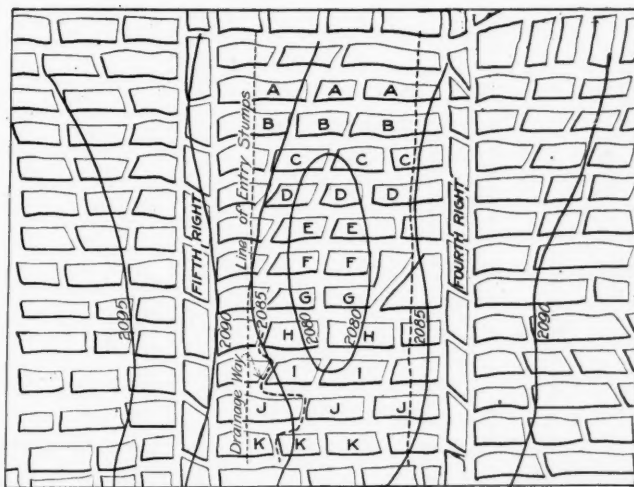
Granting that the foregoing statements are true, it is readily seen that the pillars should receive the chief attention of officials, as I have shown that there is greater loss of life, property and coal than in first mining.

In the Beckley seam being mined by the E. E. White Coal Co., at Glen White and Statesbury, W. Va., there is a large overburden over the Raleigh sandstone that lies immediately over the coal and ranges from 30 to 85 ft. It therefore is necessary to extract the pillars with rapidity in order to prevent squeezing, on account of the sandstone being thick and not subject to breaking readily in the area away from the crop where no surface seams are existent.

There have been several squeezes in some of the near-by operations, where the coal was either extracted too slowly or some pillars became "wrapt up" and prevented a fall or the proper characteristic upheaval of the bottom, which would have allowed a greater portion of the pressure exerted on the coal to cease, owing to the fact that at a reasonably safe distance from the working faces of the pillars the top and bottom converge.

With excellent top conditions, therefore, and with full knowledge of its nature from previous mining and experience, we have thrown or cast aside the long-practiced "pocket-and-stump" method. This is a system that lends itself admirably to friable and ordinary slate top where breaks are short and a fall can be started at will, and is the only practice pursued in the Pocahontas field, as far as the writer can recall. Instead of this discarded method we have adopted a "slabbing" system, which enables us to concentrate our haulage. This means less timbering and less track and motor expense, and leads to a higher efficiency per loader.

We have one section now "coming back" that is averaging 20 to 25 tons per loader, and we are only



ROBBING METHODS OF E. E. WHITE COAL COMPANY

Robbing starts on pillars marked A, on heavy bottom lines. When these are out, robbing starts on pillars marked B, and so on to pillars C, D, E, F, etc., leaving the entry stumps on both sides until later.

using ten men; whereas under the "pocket-and-stump" method we would be using 15 to 20 loaders with an average loading of 10 to 12 tons by working in single places.

In addition to slabbing these pillars, taking out an average of one cut daily on the ordinary pillar 80 ft. in length, with three men, we start in the lowest point (see accompanying sketch) to extract the coal. This enables us to leave our water behind (which is contrary to the regular established system of pillar extraction) by starting at a given point and formulating a robbing line approximately 30 deg. off the course of the heading.

This is a radical change from some of the present methods of mining and robbing, both advancing and retreating, and substantiates only too well that every mine and every seam has its own peculiar and particular characteristics. It also shows that its chief supporting factor lies in the ability of the men in charge to adopt a system suitable to their conditions, one that will win the maximum amount of coal by the most economical method.

The Beckley seam is irregular, and it has an underlying seam that is regular as to thickness and general

dip, which is just the opposite in the upper split. The strata between the upper and lower split range from nothing (where both seams merge into one) to 65 and 70 feet.

When the coal in the upper seam (which runs from 4 to 13 ft. and is of an absolutely clean variety) is not extracted quickly enough in second mining, a downward pressure is exerted by the roof. This causes the bottom to heave or buckle up, and it becomes necessary to take out the pillar at once so as to avoid the height that is too low for equipment and the taking of bottom.

In many cases we have no falls whatever, and we are mining now on two slabs, one 360 ft. long, the other 250 ft. long, the machine that cuts the coal going up. When the end of the slab is reached the bits are reversed, and after the coal is cleaned out the machine cuts its way back again. In these instances the track is slewed to the face as it advances, and at a safe distance back from the face the roof and bottom are together, and no fall has occurred.

No shooting is necessary in this coal, owing to the pressure of the roof, which is just enough to break a cut up, as is often the case in our straight workings, or first mining. These long slabs, or longwall in a mild form, are experiments on our part and so far have worked out as planned; but the success of any method of mining depends on the attention it receives from the men in charge.

Pricing F.o.b. Mine with Freight Allowed

BY J. CROW TAYLOR
Louisville, Ky.

The embargoes of last spring and the priority orders of the present winter have served to turn attention to the idea of selling coal f.o.b. mine and furnishing the freight figures to destination showing just what it will cost delivered.

Some time ago I heard a mine representative and salesman who covered quite a large territory complain bitterly about the difficulties he had encountered in his efforts to serve the needs of customers. The customers were short of coal and some of the coal he had sold them had been held up by embargoes. This had necessitated his rebilling and disposing of it elsewhere after it had been put in transit. And all he got for his trouble was accusation from some of his customers of manipulation and crooked dealing.

The customers were inclined to view the matter in the light of profiteering. They believed that he had diverted cars intended for them, or else withheld shipment of their order simply because he had been offered better prices by someone else. They accused him of simply making embargoes an excuse. In fact there was so much of this that he said he had almost determined to make all his sales f.o.b. cars at the mine so that when cars were loaded at the mines and offered to the railroads for any given customer, that would settle the producer's responsibility and the customer himself could fight out the complications arising from the railroads confiscating cars or failing to make deliveries because of the embargoes, priority orders and other interference.

This one individual case might be taken to represent more an expression of personal feeling because of tem-

porary disagreeable circumstances, but there have been many such cases in the past. Numerous instances have been found where mine operators have sought to free themselves from the burden of wrangling about shipments in transit by selling their product f.o.b. the mines and simply figuring out for the customer what the total cost will be delivered at a given destination, guaranteeing the rate of freight, but not the time of delivery further than their own delivery or tender of delivery to the railroads at the mouth of the mine. This tendency has been particularly noticeable in connection with making contracts. Just to what extent this new policy will prevail will probably depend upon the conditions of car supply and the ability of the railroads generally to handle the needs of the country in the way of coal transportation.

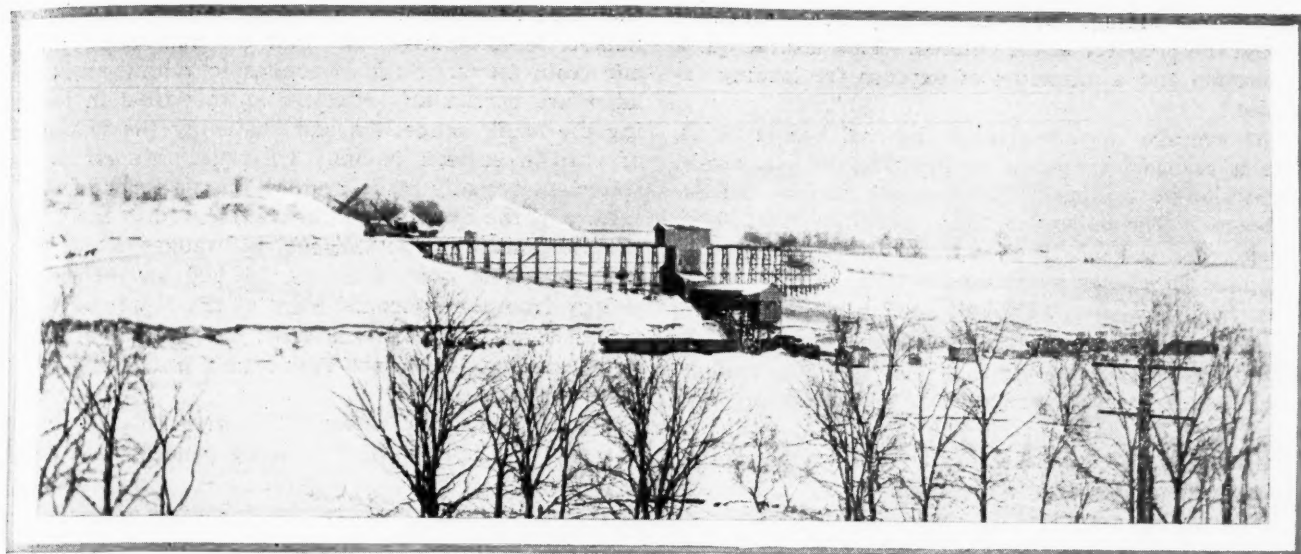
It is practically a reversing of the usual selling plan, for heretofore most sales managers and jobbers have builded their business largely upon selling coal delivered to the customers at a specified price. Usually the customer is more interested in knowing exactly what his cost will be on coal delivered than he is in figuring out freight rates from various points to determine just where and how he might better himself a fraction. It has been the lot of the sales manager and the wholesaler to unravel the complexities of freight-rate combinations and profit thereby, because he who is well posted in traffic matters can often figure out a profitable saving in freight while at the same time satisfying both the mine operator with his positive price at the mine and the consumer with his positive price delivered.

This figuring of freights is a form of service that the jobber has argued is worth something, and as a consequence he has made a specialty of this kind of work. To reverse the plan of selling and make prices f.o.b. mine with the freight rate guaranteed would seemingly result in eliminating all chances of the jobber profiting from such service.

With a return to normal conditions so that freight will move smoothly and the majority of people will be plentifully supplied with coal, there will be found a natural appeal in the idea of resuming the present practice of making delivered prices to the consumer and handling the freight rate problem as a part of the selling proposition. On the other hand, with a continued shortage, and when as now wrangling and charges of unfairness are piling up, there is a natural disposition on the part of sales managers to favor the idea of selling at an f.o.b. mine price and shifting the burden of freight misunderstandings to the railroads and the consumers.

Perhaps nothing is more illustrative of the goading they have been subjected to and the trying times that sales managers have been going through in the coal industry than the present tendency toward favoring f.o.b. mine prices.

APPROXIMATELY FIFTY MILLION car stops are made in the United States each day. The "skip-stop" schedule would eliminate one-third of these. The elimination of six billion stops a year, together with the regulation of car heating, will bring a fuel saving of not less than 1,500,000 tons of coal a year, which will meet the fuel needs of 300,000 average families.



Modern Coal Stripping in Ohio

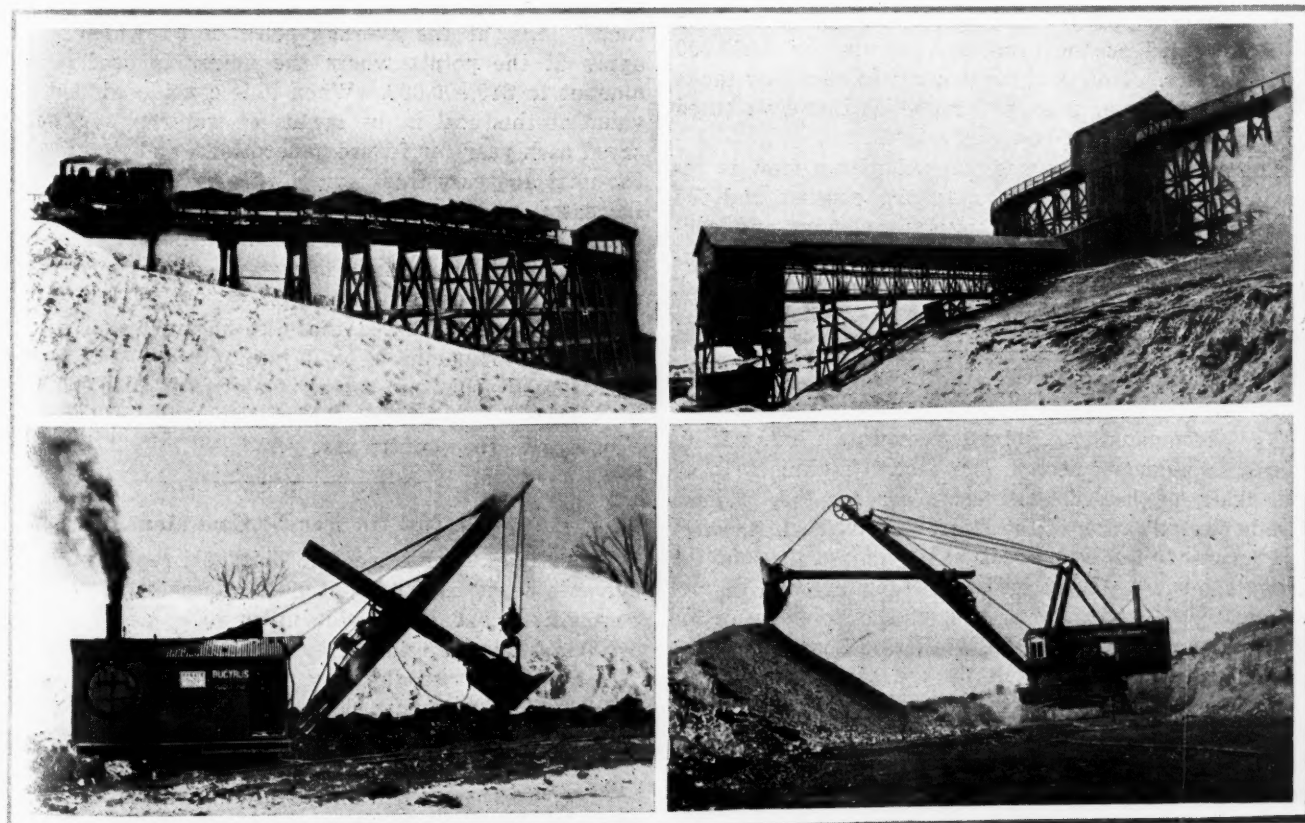
By W. E. HOLLOWAY
Cleveland, Ohio

ONE of the latest Ohio coal properties to be worked by means of the stripping process lies in the Smithfield district of Jefferson County. This is the property of the Superior Coal Co., of Wheeling, W. Va. E. T. Hitchman, a man of long and varied experience in the operation of coal mines, is president and general manager.

The first carload of coal was shipped from this operation on Dec. 1, 1917, just seven months after the

placing of the contract for the loading facilities. The property consists of 2500 acres and it was necessary to construct one-half mile of railroad siding in order to develop it.

The coal is known as Ohio No. 8. It is a high quality of steam coal and on this particular property runs about 5 ft. 3 in. in thickness. Careful consideration was given to the arrangement of the railroad sidings and the method of working the coal and preparing it for mar-



TWO VIEWS OF THE TIPPLE AND THE LOADING AND STRIPPING SHOVELS IN ACTION

ket. Three sidings were accordingly built, arranged around the property at the outcrop. This insured quick production and a minimum of expense for loading facilities.

The average cover overlying the coal bed is 21 ft. This is removed by means of two Bucyrus No. 225-B, steam shovels equipped with 6-cu.yd. dippers and 80-ft. booms. The boilers of these machines are 250-hp. capacity and the shovels are among the largest used in stripping work, each weighing 420 tons.

Bucyrus shovels are also used for digging and loading the coal. These are of the caterpillar type, No. 35-B, equipped with 1½-cu.yd. dippers. One stripping and one digging shovel work in from either side of the property toward the center. This greatly reduces the time of handling the coal from the shovels to the tippie, for no shifting of shovel trains is necessary.

Four Vulcan saddle tank locomotives handle side dump cars of 5-cu.yd. capacity each. These cars are placed in trips of 10, and while one train is being loaded the other is at the tippie being unloaded. From here the trip passes through the tippie and around to the second shovel. By this method of train manipulation the company is prepared to load 1800 to 2000 tons per day.

At the tippie the coal is deposited in a 50-ton receiving bin from which it is delivered to a crusher or bypassed direct to a conveyor where picking is done. This conveyor delivers to a bin over the railroad siding. This bin is employed to facilitate the moving or changing of railroad cars without stopping the operation of loading.

The crusher and conveyor are driven from a 150-hp. horizontal steam engine, boilers for which are located in the rear of the tippie.

The water-supply for this operation is obtained from a dam located on the property, impounding 3,000,000 gal. of water. This is pumped into two receiving tanks of 47,000 gal. capacity each, from which it is distributed to the shovels, tippie and locomotives.

The entire operation was planned with a view to reducing to a minimum the operating expense and the amount of machinery necessary for producing and loading coal. It was designed by and erected under the supervision of the Willis E. Holloway Co., of Cleveland, Ohio, working in conjunction with Mr. Hitchman.

Use of Electricity in Saving Coal

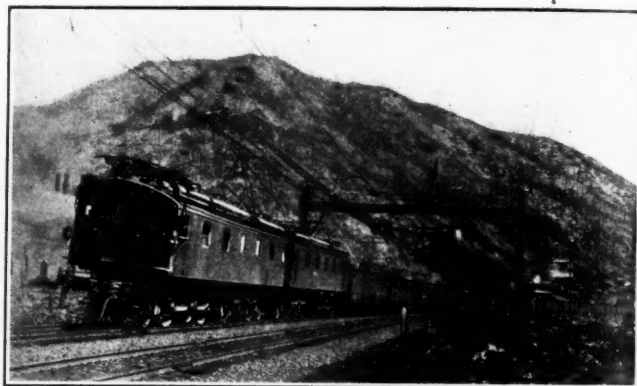
The accompanying illustration shows a 270-ton Baldwin-Westinghouse electric locomotive hauling a 3250-ton train of loaded steel coal cars up the Elkhorn Grade electrification of the Norfolk & Western Railway.

Previous to the electrification it required three of the biggest modern Mallet locomotives equipped with mechanical stokers to haul a train of this tonnage up the Elkhorn Grade at a speed of 7 miles an hour. Now two electric locomotives haul it up the same grade at 14 miles per hour, or double the speed formerly obtained by steam locomotives. As a matter of fact, in cold weather it was frequently necessary to reduce the tonnage of the train considerably in order to permit the steam machines to get it up the grade.

With electric propulsion, the same coal traffic can

therefore be handled with about one-third the former number of locomotives and half the number of engine and train crews. Such economies in rolling stock and labor are particularly effective at this time in lessening the traffic congestion and hastening the movement of coal to eastern points. Of equal interest is the statement recently made by the Commissioner of Agriculture of the State of Montana in regard to the use of electric power by the Chicago, Milwaukee & St. Paul R.R., which is now obtaining 160,000 kw. of electric energy from the hydraulic plant of the Montana Power Co. The saving in fuel effected by this use of water power instead of coal has been highly gratifying to the state officials.

The commissioner states: "To give an idea of the value of the power which is being generated by these



BALDWIN-WESTINGHOUSE ELECTRIC LOCOMOTIVE
HAULING TRAIN OF LOADED COAL CARS

plants it may be stated that to produce 160,000 kw. from coal would require the yearly consumption of 2,500,000 tons. This, at the average price of \$4 which would apply at the points where the power is used, would amount to \$10,000,000. When it is considered that the value of this coal is, by means of water power, being saved each year for future generations, and that during the next 10 years this saving will in all probability be increased seven or eight times, it is not difficult to understand that true conservation consists in encouraging the rapid development of water power, which unless developed and utilized becomes lost for all time."

It has been estimated that the national shortage of coal last year amounted to 50 million tons. The saving therefore by this one company alone of 2,500,000 tons of Montana coal amounts to 5 per cent. of the total shortage in the country last year.

Oh, No! He Was No Coal Man

Recently an operator of the Clearfield region of Pennsylvania went to Washington to complain that official requisitions had been made upon his mines for about 1,000,000 tons more than they were capable of producing. After being passed along by nine different officials, the operator finally reached the sanctum of a dynamic young man who admitted responsibility for the requisitions.

"Are you a coal man?" the operator inquired.

"Oh, no," replied the fuel administration official. "I was an automobile salesman before I got this appointment."—*N. Y. Tribune.*



The Food Administration Asks You To Save Tuesdays' Meat for the Men in the Trenches.

THE FOOD ADMINISTRATOR, HOWEVER, DOES NOT ASK YOU TO GIVE UP MUTTON AND LAMB
Acknowledgments to Gaar Williams

THE LABOR SITUATION

EDITED BY R. DAWSON HALL

General Labor Review

The miners in the anthracite region are many of them disgruntled at the recent increase in the dues payable to the union. A meeting to discuss the matter was declared "disloyal and traitorous" by President James Matthews, of the 9th district, at Pottsville. The manifest need for the change in dues does not seem to appeal to the dissentients, but it could easily be proved were they minded to accept proof.

The Reliance colliery of the Philadelphia & Reading Coal and Iron Co. struck on Mar. 8 because the officials of the company refused to add two men on each shift of firemen. Even foremen and clerks were compelled to man the boilers though it is usual for the union to provide men to do this work when mines are on strike, even when the union regards the strike as justifiable, for the mines must be kept free of water and gas or they will be shut down almost indefinitely. Seven hundred men were laid idle by this strike at the Reliance colliery.

CENTRAL PENNSYLVANIANS WANT WAGE INCREASE

Central Pennsylvania mine workers are seeking an increase in wage to absorb the new increase in price conceded by the Fuel Administration. The miners want a 20c. a ton advance, and the day workers want another \$1 per day, the boys to receive, however, only 55c. The concession was given to the mine operators to make the prices gibe with the costs of operation, but ignoring that fact the mine workers want an equivalent rise in the price of their labor. The mine workers have demanded a joint convention with the operators of the district.

It was reported at the recent biennial convention in western Pennsylvania that 76 new locals have been established in the district, and that 52 more coal companies are now making contracts with union labor.

In Ohio the miners in the 8-A seam are talking strike quite menacingly. As noted last week in this department the men believe that a revision of the scale should be made in recognition of the thinness of the measure in which they have to work. The Cambridge district miners are interesting themselves in seeing that they get a fair apportionment of railroad cars. When certain of the mines could not run by reason of high water the mines were rated as having received their full apportionment of cars. When the floods receded the mine workers were idle because cars were not supplied. On Mar. 7 a delegation of Cambridge district mine workers called on Governor Cox to protest against this treatment and he ordered James B. Dugan, chief inspector of the public utilities commission, to take up the complaint with the railroad officials whom Dugan claims are violating agreements.

HITCHMAN MEN JOIN UNION OF THEIR OWN WILL

The Hitchman Coal and Coke Co., in West Virginia, it will be remembered, enjoined the United Mine Workers not to interfere with its operations by unionizing its employees. On Mar. 4 the International President, Frank J. Hayes, and nine other officials filed briefs declaring that if the tonnage of the Hitchman Coal and Coke Co.'s mines was reduced it was not due to labor troubles and that if any of the men employed by the company joined the union they did it of their own volition and not because of any encouragement on the part of the union. They presented 22 affidavits to this effect.

In Preston County, West Virginia, the miners are demanding a reduction in the price of blasting powder. At the mine of the Kingwood Coal Co., although the company does not handle powder, the mine committee has served notice on it that if it did not provide powder for \$2.10 a

keg the mine workers would strike. Other companies have received similar demands but they have been couched in milder form.

In the Georges Creek field of Maryland the miners are also asking increased wages.

The biennial conference of western Kentucky, held at Louisville, was addressed on Apr. 6 by the Rev. Dr. Richard Wilkinson, who spoke on the necessity for coöperation with the nation in its war policies. On the following day the delegates pledged their loyalty and promised not to strike during the war. Should the union, however, continue in its determination to use the war as a means to extend its affiliations in the western Kentucky field, as has been ordered by the international conference and already foreshadowed by union action, it is hard to say what may happen in western Kentucky.

MINERS REFUSE TO WORK WITH ENEMY ALIENS

Some mine workers at Greenwood, Ark., composing local No. 1842, have addressed a resolution to Newton D. Baker, the Secretary of War, protesting against the employment of enemy aliens in the mines, seeing they are being discharged from the army, and urging that mining work with its hazards to the employees is made more hazardous by the presence of men who are unfriendly to the native mine workers and may "by the slightest negligence or by malicious conduct" jeopardize the lives of their coworkers. They also protest against the employment of enemy aliens because they "take the place in the mines of our boys who go to the front." On the whole, however, no one can note that enemy aliens have been doing, in the coal mines, the acts anticipated of them. Moreover, a man might be quite a loyal worker behind the lines and yet could not be depended upon to strike down those of his own race in the battle line.

A somewhat similar condition exists near Lansford in the Pennsylvania anthracite region at mines of the Lehigh Coal and Navigation Co. Twenty-one Austrians were drafted into the national army prior to the declaration of war with Austria-Hungary. When war was declared with that country they were discharged and they returned to the mines. The other miners refused to work with them. One of the men is said to have made slighting reference to the United States uniform. Two others tried to persuade men of Austrian parentage from joining the United States army or the Slovak-Bohemian army. These men have been arrested. The 21 Austrians have been discharged and the strike is now at an end.

MICHIGAN MINES SETTLE DOWN TO STEADY WORK

In Michigan, it is said, that President Crutchfield's desire to turn the Albion strike into a state-wide suspension was due to union politics. Robert Gaffney, of Bay City, with the other international officials has been in favor of ending the strike. Crutchfield is to be retired from the presidency, and he desires to get Gaffney's berth as international board member, whereas Gaffney is a candidate for reelection. On Mar. 6 W. K. Prudden, State Fuel Administrator, tried to solve the difficulties in a joint conference of mine operators and union men held at Lansing, Mich. He seems to have been entirely successful and the Albion men went back to work Mar. 8 with an increase in wage of 30c. a ton, the rate being now \$1.30.

The only question remaining to be settled is whether the increase shall be dated back to Nov. 1, the date of the Washington agreement. This matter will be left to Dr. Garfield for settlement. There is still a discussion at Saginaw where a 10c.-per-ton increase is demanded. The Albion operators have, since Jan. 1, been willing to increase the rate 15c., but on Mar. 6 they gave the increase demanded.

It appears that the referendum regarding a strike in Michigan mines was quite favorable to that action, Crutchfield declaring on the date of the conference that 4 or 5 men favored it in their votes to every one who opposed it. Only the settlement at Albion relieved the situation. It now appears that Crutchfield will be safely elected as international board member.

The Colorado split is becoming wider. The United Mine Workers refused to accept a delegate to the biennial conference because he was a delegate also to the Independent Union of Miners of America. The delegates declared also that they would not attend a meeting to be addressed by British labor officials because John R. Lawson, the president of the Independent Union of Miners of America, was scheduled as chairman. The new union claims 3000 of the 5000 union members in the fifteenth district, whereas the United Mine Workers claims that the United Mine Workers of America has nearly 8000 members.

In Nova Scotia the agreement of the Dominion Coal Co. with its miners was duly ratified about Mar. 1. The terms of the agreement appeared in our issue of Feb. 23. The men get an increase of about 17 per cent. or a trifle less than a million dollars a year. About 5000 men work at the mines of the Dominion Steel Corporation, and all participate in the new scale.

The strike in Drumheller, Alberta, narrowed down ultimately to a strike at the Rosedale mine. On Feb. 27 W. H. Armstrong, director of coal operations, demanded that the day wages and working conditions set forth in the agreement in force at other mines in the Drumheller district be observed. According to J. F. Moodie, the general manager, this meant a reduction in wages of from a few cents to 75c. a day. The men went back to work, however, but on Mar. 4 they struck again. Yet on Mar. 7 it is recorded that they were working.

Central Pennsylvania Asks More Pay

The biennial convention in central Pennsylvania came shortly after the decision of the United States Fuel Administration to increase the price of coal from that district 60c. so as to make the production of coal profitable to all the operations in that district that are conducted with reasonable efficiency. The mine workers who got an increase when the 45c. increase in prices was made—and in fact that increase in price was granted so the wage increase could be safely conceded—believe they should have a like increase to accord with the new price.

If the advance should be granted the aims of the Fuel Administration would be circumvented. The concerns which from low coal, higher freight rates, difficulties in operation and inadequacies of equipment cannot produce the cheaper coal would be forced out of business as they threatened to be when the price for run-of-mine was \$2.45 instead of \$3.05. Only the concerns with favorable conditions would be able to pay an increased wage and go on working.

It was not so when there were large contracts at more than Government prices to sweeten the dose which the Administration had ordered the industry to swallow. More and more it becomes true that only Government prices are obtained, and if these are kept to the lowest operable basis the mortality among coal concerns will be high. Apparently Dr. Garfield has decided that it will be higher than is desirable. The increase he made was to avoid that mortality, but if the miners get the increase, the end of many coal operations will be a matter of a few weeks.

It begins to appear that there is but one decision possible with the Fuel Administration. It is already setting prices; it must also inevitably prepare itself to set wages. The right to regulate one is just as clear as the right to regulate the other.

The central Pennsylvania convention met in Dubois, Penn., on Feb. 27 with delegates clamoring that the coal miner who got an increase of two-ninths of the 45c. advance should receive two-ninths of the 60c. advance, or roughly 13½c. Presumably the rest would go to the other mine workers as in the 45c. advance.

The whole uneasiness in the district arose from the higher rate paid per ton to the miners in the Broad Top and Osceola districts, so for this reason the unrest mainly concerned itself with miners' wages and not with the day wages of the other mine workers.

On Feb. 28, when local 64, of Holsopple, presented a resolution for the nationalization of coal mines, it was unanimously approved by the assembled delegates. They also declared in favor of "clean coal" with equal unanimity, but the resolution on the subject was returned to the committee for alterations which would take cognizance of the fact that the obligation to produce clean coal rested equally on miners and operators. Some of the miners declared that the operators were mainly to blame for the loading of bony coal. According to the delegates the operators were loading out bony material that had been left lying in piles for years and ordering the miners at the coal face to load bony coal with the clean.

DO NOT LIKE UNIONS OR INCREASED WAGES

The Indiana County doctors came in for much criticism. They had done two extremely wicked things. They had, to begin with, formed a new union or association, and they had increased their fees. Now men who form a union and increase their pay are demonstrably "profiteers." The mine workers sought to get some authority in the selection of mine doctors. This is almost sure to come sooner or later. The men so selected may in some cases not be the best of men, for good professional men are little disposed to have their services hang on the issue of a vote, but today there are cases in which the selection of the doctor by the mine management is not wise and not altogether uninfluenced by pelf.

The mine workers ask also for better "company houses" with water service and more defense against the cold. The rent, however, is already inadequate. House ownership around the mines is now too often a debit, not a credit. So long as rents remain at their present low level improvement cannot be granted without adding a loss on the houses to the cost of the coal.

BROAD TOP DIFFERENTIAL MADE ALL THE TROUBLE

The Broad Top differential was a big source of dispute. The Central Pennsylvania district as a whole when the contract was modified by the Washington agreement asked for a 33½ per cent. increase and obtained a 25 per cent. increase, the allowance of all the other districts. The Broad Top field held out and got 10c. more a ton for the mining of coal, as is stated in our issue of Dec. 15, 1917. This 10c. was to continue till Apr. 1 and then was to be removed. But, as might have been expected, the Broad Top men do not want to suffer the reduction in price to which they agreed in their contract. Despite much urging, the delegates refused to do anything for the Broad Top miners. The Clearfield County district—using the word in its narrowest interpretation to include the district around Osceola, Houtzdale and Madera, where the Independent Operators' Agreement of Clearfield and Center Counties is in force—has the same rate as the Broad Top district. Apparently this arrangement is unlimited as to time, and it is generally understood that it is to be operative till the war ends.

The policy committee ultimately brought in a resolution asking for an increase of 20c. per ton and \$1 per day for all day hands except trappers and boys under 18 years of age. These employees are to get an increase of 55c. per day. Of course the Broad Top and Osceola-Houtzdale-Madera miners who have the larger wage are to get smaller increases so that their advantage will be removed.

Though there was some opposition to increased international dues it did not have any strength. It was decided eventually to raise the dues 26c. per month which will make the miner's dues \$2.28 and the day man's dues \$2.26 per month.

When the vote for the next convention city was counted it was found that Johnstown had 87 votes, DuBois, 70; Indiana, 10; Philipsburg, 14; Kittanning, 1; and Barnesboro, 0. All but Johnstown and DuBois were cast out and a second vote gave Johnstown 99 votes and DuBois 89, there being 8 more votes cast in this final ballot.

EDITORIALS

Nonessential Industries Should Not Expand

THE action of Congress in refusing to give the authorities power to curb the issuing of new securities for the expansion and initiation of non-essential industries is much to be deplored. We may well have consideration for the workmen and capitalists who have invested their abilities—mental and financial—in industry and feel that it would disturb the nation unduly and with little advantage to ruthlessly put them out of business and on to the street.

But clearly we have a duty to keep persons from entering into new businesses during the war wherever we feel that the business is not of any advantage in the prosecution of the war—our supreme duty. Stores, theaters and hotels are being erected where there is really no need for them. To add to these industries is to add to the number of those institutions which may ultimately have to be curbed.

When the automobile industries catering to the pleasure seekers are voluntarily restricting production 30 per cent., no new automobile factories should be erected and no new companies be formed. Action should have been taken long ago. The public will be happy if it can retain a few of its luxuries during the war. It will certainly be ill advised if it tries to add to them.

The Governor Closes His Eyes and Dreams

IN early days we used to delight in dreaming that we had money in scads, and that we had no difficulties except to bestow it where poetic justice and our generous instincts would dictate. Sometimes we got that wealth from the sea water, where there is an unbelievably large stock of gold more hopelessly watered than any stock on the New York Curb.

But why not dream? M. G. Brumbaugh, of Harrisburg, and W. S. Tompkins, of Wilkes-Barre, admit that they do it. They have been dreaming of how they would take the methane out of the air of the mines and sell it for burning under boilers and, with that money, Mr. Brumbaugh, who is governor of Pennsylvania, would pension the mine workers.

The pension prescription reminds one of the old recipe for the making of hare soup which began with the words: "First catch your hare." Before the big-hearted governor schemes pensions let him find out how diluted methane can be concentrated. At present it seems that the fixation of nitrogen is far nearer profitable accomplishment. Yet there is more nitrogen in air than methane in the mine atmosphere, and the air of the woods and the fields is without ownership; whereas there might be more question as to the air sucked or forced, out of the mines and enriched by the gaseous emanations of the minerals below.

However, if it pleases Messrs. Brumbaugh and Tompkins to dream such miracles of science and scheme how they may be utilized, why should we object? Like the

man who was hectored by his puny wife we may say, "It pleases she and doesn't hurt I." Why take offense so long as Mr. Brumbaugh does not ask the industry to store enriched mine air till such a time as he finds a way to turn it to a commercial use.

Concrete Industrial Homes

A DOLLARS AND CENTS proposition generally secures the attention of business men everywhere. Often this feature is not antagonistic to the treatment of industrial problems along humanitarian lines, as evidenced by recent improvements in the housing of employees at large plants in various industries. This is notably true in coal mining.

Suitable house accommodations attract and hold the better class of labor. Then there are great numbers of employees at the mines who are not Americanized, their living conditions often are not conducive either to efficiency or morality. Good citizenship does not seem to have appeared at all as a factor in the lives of many of our foreign-born laborers. They may live far from their work in crowded quarters—bachelor colonies existing according to their traditional standards of living.

It has been aptly expressed by one who has made a close study of such problems: "To remedy these conditions—to bring the workers closer to their work, to house them comfortably and economically, and under such an arrangement as to minimize the tendency toward over-crowding; to induce to more nearly normal, a more American recreational expansion of the individual; to inculcate a sense of appreciation of the better things in home and community life—with no less ambitious an idea the problem was undertaken by a steel company in Youngstown, Ohio."

Considering the housing problem from a technical standpoint, concrete offers a building material of exceptional advantages. A number of methods have been worked out which have been successfully used. Those will probably survive as fittest which follow ordinary contract methods—those which do not use excessively heavy, unwieldy or complicated forms in construction.

Meeting the objection of excessive standardization in similarity of design—whole rows of houses exactly alike—specialists have developed methods which give a pleasing effect by varying the style of houses. Different colors of cement stain also relieve monotony. Eliminating severe lines of straight streets and substituting curved ones makes a pleasing change. But isolated groups of houses around open courts, is a scheme tabooed by one of the larger anthracite companies. Preliminary to erecting extensive accommodations for its men, it gave the matter considerable thought. The sentiment among the employees favored the old close formation of mining villages with easy access to shopping and amusement centers.

The consensus of opinion of those who have lived in

both frame and concrete houses favors the latter type of construction. One thing stands out forcefully, and that is the solidity and tightness of the concrete house in low temperatures during high winds. If this point required a practical demonstration, the conditions of the winter of 1917-18 should have provided it conclusively. Evenness of room temperature in both summer and winter adds much to the comfort of those living in dwellings of cement construction.

At one time concrete houses were damp under certain conditions. But this objectionable feature has been removed on a better understanding of the contributing causes. Dampness on the interior surfaces of concrete walls may be due: First, to poor concrete, which is so porous as to permit the moisture to strike through from the outside. Second, cracks, from various causes, through which moisture penetrates to the inside. Third, lack of continuous air space for insulation in the wall, or lack of proper ventilation so that moisture in the air inside the house condenses on the walls. Continuous air space is readily provided by furring, lath and plaster at nominal cost.

Considerable literature on cement and concrete construction has been distributed through the medium of technical and trade journals, pamphlets and circulars of manufacturers and associations and practical works by various authorities. This building material lends itself to a great variety of applications. There is little excuse today for anyone to plead ignorance of its value and many uses.

Paying for Services Rendered

The many schemes for regenerating the world after the war all seem to take it for granted that natural law will be suspended and economic law repealed. But just as most of us regarded the world with some misgivings before this war, so after it is over we expect to find it hampered by the laws of nature and the imperfections of mankind.

Last week reference was made editorially to the inadvisability of making a uniform price for coal winter and summer, thus causing idleness in the summer when work is unhampered and causing excessive activity in winter when every kind of difficulty interposes. A proposal of the British labor party, just as much to be criticized, is that coal should be sold at one price regardless of the distance over which it has to be transported and regardless of the difficulty of transportation.

In a country larger than Great Britain perhaps it would not have occurred to the labor leaders to ask for a perfect uniformity of price regardless of all geographical and transportation considerations. But the principle is the same whether a country be large or small.

The manifesto of the Labor Party in regard to this matter is as follows:

"There is no reason why . . . the consumer [of coal] should be made to pay more in one town than in another. What the labor party would aim at is for household coal of standard quality, a fixed and uniform price for the whole kingdom, payable by rich and poor alike, as unalterable as the penny postage stamp."

Under this arrangement the mine worker would be

deprived of the privilege of buying coal below cost as he insists on doing today in America. He would have to pay as much for it as if he lived say 500 miles from the mines instead of within hailing distance.

If this unalterable charge for extremely variable services is to be extended to coal for industrial purposes no plant will try to establish itself, and no person will build, with any regard for accessibility. The problem of delivery is left to the Government which also must deliver coal of a standard quality—a thing obviously not possible of accomplishment.

The fact that the burden of transportation for long distances has hitherto been thrown, in the main, not on the transporter but on the consumer has tended to make the consumer move toward the source of supply. It has prevented big iron mills being erected in Kansas and beet-sugar mills from being built in New Mexico.

But granted a rate independent of distance and all the plants of the country will be erected to satisfy passing whims. Let us suppose that at a certain location there is a good foundation for a blast furnace making erection easy. The iron ore is found 1000 miles away; the coke must come some 800 miles; the nearest limestone is 400 miles distant; there is no water readily available; the market is across some half-dozen state lines. What do all these things matter when the world is run rigidly on a uniform-delivered cost basis and the Government does the hauling? The foundation for the mill or the idiosyncrasy of the mill operator is the only consideration.

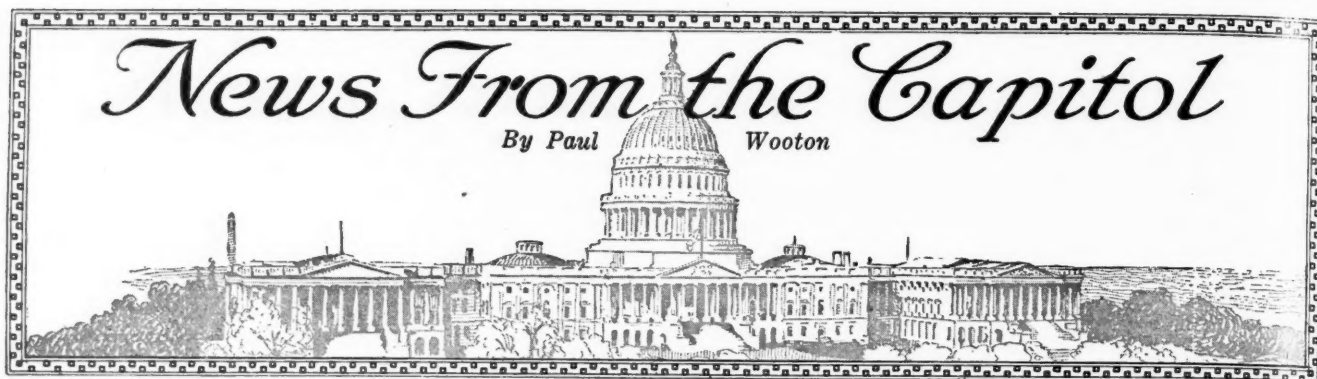
Everything will be done without regard to zones as soon as our zones are removed. Some economic feature must replace the zonal law. But the labor leaders of Great Britain would have us forget after the war the lessons taught by the necessities of the conflict, and among these lessons is the necessity for reducing needless transportation.

There is too much transportation now. Some states seem devoted to the manufacture of raw, or at least crude materials; others devote themselves to finished articles. The raw material even now often travels to the East to be refined, then to the West to be made into merchantable products and then back to the East for actual merchandizing.

The only safe and reasonable cure for this shifting back and forth is a fair and proportionate charge for transportation. If a man will persist in living or in operating where transportation is uneconomical the high prices for everything will be the best way of convincing him that his action is contrary to public interest and his private profit.

If, however, domestic fuel alone is made uniform in price the damage will not be as great. But the principle seems best which leaves the heavy burden of transportation on the man who elects to make that transportation burdensome.

Probably the labor leaders who penned the manifesto will see this point as clearly as anyone. They declare in their statement that "no labor party can hope to maintain its position unless its proposals are, in fact, the outcome of the best political science of its time." From this declaration more hope can be drawn than would be possible had they declared, with many labor men, that all economic and political law is to the labor movement but a source of stumbling and offense.



Regulations Governing Retail Distribution

In an effort to secure the broadest and the most equitable distribution during the coming coal year, the Fuel Administrator has prepared an extended list of regulations governing retail distribution. With their promulgation, he has announced that anthracite prices will be subject to an average reduction of 30c. a ton, effective from Apr. 1 to Sept. 1, rather than continuing the plan of the sliding scale of reductions. The retail regulations, in full, are as follows:

Every consumer should be urged on or before Apr. 1, 1918, to place with his regular dealer his order for his reasonable normal requirements for the year ending Mar. 31, 1919. Such orders must be made in writing and must state substantially the information called for in Regulation 3 hereinafter set forth. When such orders have been entered, the dealers shall proceed to make deliveries thereon, until each consumer, willing to accept the same, has received two-thirds of his normal annual requirements, provided that orders of six tons or under may be filled in full. When all consumers, who are willing to accept it, have received two-thirds of their normal annual requirements, the dealers may proceed to fill the balance of such orders up to normal annual requirements of each consumer. (The provision for two-thirds delivery should apply only to anthracite. With respect to bituminous for domestic use, the dealer may proceed to deliver the consumer's normal annual requirements.) If a consumer already has a quantity on hand, he shall receive only such additional amount as shall make up his normal annual requirements.

New consumers who are unable to have their orders accepted by a dealer should apply to the local fuel administrator, who should see that their requirements receive attention from the proper dealer. Carload or barge-load lots shall not be delivered to a single domestic consumer or to a group of consumers except with the permission of the local fuel administrator. Dealers shall file with the local fuel administrator on the first of each month a statement containing the names and addresses of consumers to whom deliveries have been made during the previous month and the quantity delivered to each.

The following regulations have been established by the United States Fuel Administrator:

1. Until further notice no domestic consumer of coal or coke shall purchase, receive or otherwise take possession of more coal or coke than is required for his actual and necessary requirements prior to Mar. 31, 1919. If such consumer already has a quantity on hand he shall receive only such additional amount as shall make up his actual and necessary requirements prior to that date.

2. No person, firm, association or corporation, whether acting alone or in conjunction with others, shall, directly or indirectly, provide any domestic consumer of coal or coke with more coal or coke before Mar. 31, 1919, than is necessary, with the amount already on hand, to meet the

actual and necessary requirements of such consumer prior to that date.

3. On and after Apr. 1, 1918, no person, firm, association or corporation shall sell or deliver coal to a domestic consumer who does not first furnish to the person selling or delivering such coal a statement which the consumer declares in writing to be true, and which specifies (1) the amount of coal the consumer has on hand, (2) the amount of coal he has on order and the name of the person from whom ordered, (3) the amount of coal used by him in the 12 months ending Mar. 31, 1918, and (4) the amount of coal needed to meet his actual and necessary requirements prior to Mar. 31, 1919; provided, however, that this regulation may be modified by any state fuel administrator within his own state under such circumstances and conditions as he may deem proper.

4. On and after Apr. 1, 1918, and until further notice, no retail dealer shall, unless authorized by the state fuel administrator, deliver or cause to be delivered to any domestic consumer more than two-thirds of his normal annual requirements of anthracite coal until each domestic consumer who has placed his order with said dealer and is willing to receive delivery of the same has received two-thirds of his normal annual requirements for the year ending Mar. 31, 1919; provided, however, that orders of six tons or less may be filled in full.

Any dealer or consumer who violates the foregoing regulations will be subject to the penalties prescribed by the Lever Act. Such further regulations will be issued as may be necessary to enforce the essential features of the foregoing plan.

To Insist on Clean Coal

An order expected to insure the cleaning of coal to prewar standards was issued by the Fuel Administrator last week. If a shipment of coal is found to contain an unfair amount of noncombustible matter, the operator may re-prepare the shipment or it may be delivered to the consignee with the understanding that 50c. a ton may be deducted from the authorized price. The intent of the order is stated to be to reinstate the cleaning of coal at the working face and to reinstate the employment of slate pickers. The order in its entirety is as follows:

Section I. Authority is hereby given to the district representatives of the United States Fuel Administration to appoint a sufficient number of inspectors in their respective districts to carry out the terms and provisions of this order, and to assign to each of said inspectors a particular territory.

Section II. It shall be the duty of each of said inspectors:

1. To cover his territory at as frequent intervals as may be consistent with thorough inspection; the inspectors shall be qualified by knowledge and experience of the particular district or districts in which the inspection is to be per-

formed, and shall familiarize themselves with the conditions under which the coal is produced and prepared, so as to enable them to effectually carry out the terms and provisions of this regulation, the intent being to reinstate the cleaning of coal at the working faces of the mines; to reinstate employment of slate pickers with a view of bringing the ash contents of coal back to approximately the standard of normal times. Furthermore, where the coal in any part of the mine is found to be naturally of such character as to be unfit for market, judging from the usual standard of the district, the district representative may order the mining suspended in said part or parts of a mine until or unless proper cleaning methods be adopted; provided, however, that the workings shall not be so suspended where the nature of the mining to be done is necessary to preserve the mine from damage, or where a cessation of work endangers life or may result in serious risk of flooding, of explosions or of squeezing.

2. To report daily to the district representatives of the Fuel Administration mines inspected, the condition of the coal as loaded; methods being employed to prepare and clean the product, whether or not the product being shipped to market is, in his judgment, a well-prepared and merchantable product. All reports of inspections shall be made in quadruplicate, one to be forwarded by mail to the Fuel Administration, Department of Inspection, at Washington, D. C.; one to the district representative; one to the operator; and one to be retained by the inspector for his personal files.

Section III. Inspectors are authorized to condemn at the mines any coal loaded in railroad cars which, in their judgment, is not properly prepared; and any inspector finding unmerchantable coal shall immediately notify the district representative and the operator by wire or in person or in person and in writing, giving the car numbers and initials of any and all cars so rejected and stating the facts on which such action was based. A copy of such notice shall be immediately mailed to the United States Fuel Administration, Department of Inspection, and to the district representative. If the district representative approves the inspection report, he shall so notify the operator at once; in which case, unless the operator unloads and re-prepares the rejected coal, the consignee shall be permitted to deduct 50c. per ton from the authorized price for the grade of coal with which the car is loaded; provided, however, the consignee after examining the coal may at his option pay and the operator may receive the full authorized price. Each invoice covering the sale of condemned coal shall bear the following notation, "This reduced price is fixed by the United States Fuel Administration as a penalty for improper preparation." The operator shall thereupon immediately report to the United States Fuel Administration, Department of Inspection, at Washington; and to the district representative the disposition made by him of said car or cars of coal, and shall accompany his reports with a copy of the invoice.

The district representative, where repeated violation of this regulation has taken place or in flagrant cases, shall require a special written report from the operator, which report shall be transmitted by said district representative to Washington with his conclusions thereon, all of which is subject to review by the Fuel Administrator.

This order or regulation shall not operate to change the terms, conditions or validity of existing contracts, but new contracts shall be made subject to this order.

While the order with regard to clean coal has been contemplated for some time, it was hurried by reports from fuel administration inspectors who found that considerable quantities of anthracite were being marketed which did not come up to the standard. It resulted in the condemnation of 1600 tons of coal in Pennsylvania markets. William Potter, the fuel administrator for Pennsylvania, has had the matter of cleaning coal before the anthracite operators for several weeks. In a report to the fuel administration, Mr. Potter says:

"Large shippers of anthracite, after indorsing the standard of preparation adopted by the fuel administration, are keeping their word and now are sending properly sized and prepared coal to all markets. Some of the small operators have been giving trouble, but the unloading of the cars, which contain the coal condemned because it did not measure up to the requirements, is believed to have effectually ended the practice."

Weekly Production Statistics

Continued fair weather and a better car supply permitted the production of 11,055,000 tons of bituminous coal during the week ended Mar. 2. Beehive coke production during the same week was 621,000 tons, a marked increase over the week preceding. This is the largest production since early in December. Anthracite shipments also increased and for the week ended Mar. 2 totaled 39,875 cars. Byproduct coke production for the week under review was 407,982 tons.

Production of bituminous coal during the week ended Feb. 23 was at the rate of 68.2 per cent. of full-time capacity. Nearly 23 per cent. of the loss was charged to unfilled car orders. The foregoing figures are those of C. E. Leshner, the geologist in charge of coal statistics for the United States Geological Survey. The percentage of operators in each field who make weekly returns to the Survey is so great as to make the weekly estimates approximate closely the actual figures, which are not available until later.

Some New Price Regulations

Rapid progress is being made at the Fuel Administration in the general review of coal prices. This work is to be completed before Apr. 1. New prices for Iowa coal are as follows: Marion, Boone and Appanoose fields: Run-of-mine, \$2.75; prepared sizes, \$3.10; slack and screenings, \$2. This price is a decided reduction from the former prices, which were: Run-of-mine, \$3.15; prepared sizes, \$3.40; slack or screenings, \$2.90. Ninety per cent. of the coal produced in the fields mentioned is prepared sizes. Prices in the Des Moines and Albia fields remain unchanged. A 40c. increase has been allowed to all mines in Wayne County, West Virginia. The new price, which does not include the allowance made to those operators who are parties to the Washington wage agreement, are as follows: Run-of-mine, \$2.40; prepared sizes, \$2.65; slack or screenings, \$2.15.

After prolonged negotiation, which was not unaccompanied by friction, new prices have been fixed for Colorado coals as follows: Domestic coal, domestic field, run-of-mine, \$2.25; prepared sizes, \$3.50; slack or screenings, \$1.25. Steam coal, Trinidad district, run-of-mine, \$2.35; prepared sizes, \$3.25; slack or screenings, \$1.65. Lignite, run-of-mine, \$2.25; prepared sizes, \$3.25; slack or screenings, \$1. Summer reductions in the price of prepared sizes on domestic and steam coal provide for the following deductions: Domestic coal, Apr. 1, 70c.; May 1, 50c.; June 1, 35c.; Aug. 1, 15c. Steam coal (Trinidad district), Apr. 1, 40c.; May 1, 30c.; June 1, 20c.; July 1, 20c. Former prices in Colorado were: Run-of-mine, bituminous domestic, \$3; prepared sizes, \$4; slack or screenings, \$1.50.

Uniform prices have been prescribed for Montana, Wyoming and Utah, as follows: Run-of-mine, \$2.65; prepared sizes, \$3.30; slack or screenings, \$1.50. This schedule meets the complaint of the Utah operators that they were not receiving enough for their prepared sizes in addition to straightening out minor inequalities.

No Leniency to Future Violators of Fuel Administration's Orders

Great leniency has characterized the action of the Fuel Administration, until recently, toward violators of its orders, it is pointed out by H. D. Nims, Dr. Garfield's assistant, whose duties include the direction of the administration's legal department. For obvious reasons, it has been deemed best not to be too severe during the early stages of fuel control. It is believed now, however, that ample time has passed to enable all concerned to be conversant with the general procedure and in future the teeth in the Lever act will be much more in evidence. This change of policy is undertaken more with the desire to back up those who are heartily carrying out the orders of the Fuel Administrator than it is to punish the small percentage of offenders.

Criminal prosecutions have been instituted in 83 cases to date. Most of these are against the "little fellows," a number of them in the Kentucky mountains. Some complaints have been lodged against the more prominent offenders. These cases are under active investigation and if found to be justified, every effort will be made to see that the severe punishments provided for in the Lever act are brought upon those guilty.

To date the Fuel Administration has received 424 complaints alleging violation of its orders. This number excludes violation of the "closing down" order. It is expected that the number of complaints will increase to some extent when it becomes known that active prosecutions are under way.

Coal Priority List Suspended in Many States East of Mississippi River

All states east of the Mississippi River, with the exception of Pennsylvania, Maryland, West Virginia, Ohio and the eastern part of Kentucky, have been released from the Fuel Administrator's order providing for priority in distribution. The reason for this action is explained by the Fuel Administrator as follows:

"Improved transportation conditions and other helpful factors have contributed to a material improvement in the coal situation in the territory where the coal priority list has been suspended. It was deemed to be no longer necessary because the flow of coal into those states is sufficient to meet normal needs.

"Continuance of the order for a longer period would have resulted in the accumulation of reserve stocks of coal for the consumers benefited by priority. In the states where the regulation will continue to operate, the car shortage has not been entirely overcome."

BITUMINOUS COAL PRODUCTION in January of the present year was at the lowest rate since September, 1916. The United States Geological Survey blames the slump entirely on railroad congestion. The January output was 42,727,000 tons.

Coal and Coke Exports in January

Exports of bituminous coal in January were 647,681 tons. Exports during the corresponding month of 1917 were 1,071,124 tons. Anthracite exports during January of 1918 and 1917 were 239,549 tons and 295,396 tons, respectively. Exports were distributed in part as follows:

	1917 Tons	1918 Tons
Italy.....	71,773	4,505
Canada.....	584,241	455,377
Cuba.....	110,476	76,938
Argentina.....	50,207	11,579
Brazil.....	53,127	None

Coke exports in January were 84,741 tons, a slight increase over those of January, 1917.

In Charge of Zone Licenses

A. M. MacLeod, of Boston, Mass., was selected by the Fuel Administration on Mar. 13 to take charge of zone licenses. Under the new zoning plan, all coal which passes from a producing district into a consuming district other than its own must move under a license granted by the Fuel Administration through Mr. MacLeod.

Legal Department

DEFICIENCY OF COAL IN PLACE UNDER LEASE—LOSS OF RENEWAL OPTION—The English and many of the American decisions hold that when in a mining lease the parties contract with reference to a mineral known to exist, but the quantity is unknown, and incapable of certain ascertainment, and the lessee agrees to mine and bring forth a minimum quantity annually, or at other intervals, and to pay a minimum royalty therefor whether mined or not, the contract amounts to a sale of the mineral in the land, and that the lessee is bound to pay the minimum price, whether mined or not, and whether it exists or not. But when the contract relates to mineral supposed but not known to exist, and the covenant of the lessee is to mine a minimum amount and pay a minimum royalty at stated intervals, his obligation is to diligently prosecute the work of development, and to produce the minimum quantity of minerals if it exists, and not whether it exists or not. A lease—granting to the lessee for ten years a particular tract of land and a specific vein of coal known to exist, with mining rights, together with plant and improvements, fixtures, etc., with covenants of good title and quiet and peaceable possession, but without warranty of acreage or quantity of coal, and with agreement by the lessee to pay a specified price per ton for coal mined, he guaranteeing a minimum royalty of at least \$31,000, \$5000 payable at the execution of the lease and the remainder in annual installments—constituted a sale of the coal in place upon condition that it be removed within the term of the lease. And after expiration of the lease and making of such payments, the lessee is not entitled to recover on account of a shortage of coal in place, preventing production of enough coal to cover the minimum royalties paid, in the absence of proof of mutual mistake or of fraud or misrepresentations on the part of the lessor. And ordinarily recovery on the ground of fraud or mistake will be barred five years after the date of the lease, under the laws of Pennsylvania. Under a clause in a coal mining lease giving the lessee an option to extend or renew the lease for the purpose only of mining and removing coal from adjacent lands, right to the extension or renewal is lost by failure to give notice of exercise of the option before expiration of the original lease term. (West Virginia Supreme Court of Appeals, National Coal Co. vs. Overholt, 94 Southeastern Reporter, 735.)

DISCUSSION BY READERS

The Fuel Situation

Letter No. 2—I was much interested in two editorials that appeared in *Coal Age*, Feb. 23, pp. 382 and 383, regarding the securing of good, clean coal. Most of what has been written on this subject, however, is in the nature of complaint in respect to the inferior quality of the coal that is now being shipped from many of our mines. In but few instances has an effective remedy been suggested by means of which the trouble may be overcome.

One suggestion made was to the effect that the proper way to secure good coal would be to have the railroad cars inspected at their destination before being unloaded; and the statement was added that, occasionally, such an inspection might be made at the mine by competent men appointed for such purpose. It was suggested further that where a shipment of coal was found to fall below the standard set, the operator should be warned, for the first offense. For the second offense, the car was to be shipped back to be cleaned at the mine; while, for a third offense, it was stated that a fine of \$5000 might be imposed on the operator found guilty. It was even urged that the mine should then be taken over by the Government if it is inefficiently managed.

TWO PRINCIPAL SOURCES OF IMPURE COAL

To the uninformed, this proposition would seem to appeal favorably, but not so to the man who knows the real source of the trouble. There are two responsible sources for the shipment of impure coal to market. These are: (1) Dishonest miners who wilfully load slate and rock with their coal, in order to increase their daily tonnage and enable them to draw a larger amount on payday; and (2) small mines that have no means of properly cleaning the coal or that are compelled to work thin seams of inferior quality.

Before the present scarcity of labor in mines, an effective docking system was in use at all the larger operations, which prevented dishonest miners from sending out slate, rock and bony coal. At the present time most operators are afraid to enforce the docking system, because of the danger of losing their men, who will quit and go where the operator is not so particular.

Allow me to suggest that competent inspectors should be sent to the mines to inspect the coal sent to the surface by the miners, and that these inspectors should be authorized to impose a heavy fine on all miners found guilty of loading impure coal and rock, after being suitably warned against the practice. It seems to me that this would place the blame where it belongs and would be an effectual method of overcoming the trouble.

I have already referred to the small mines, most of which are run by farmers who are taking advantage of the present high price of coal. In most cases, the coal shipped from these mines is not fit for market, being high in ash and sulphur and mined too close to the

outcrop. Being unfamiliar with proper methods of mining, the men employed in these mines use dynamite to take the place of bone and muscle, blowing the coal to pieces and shattering the roof so that it is practically impossible to load clean coal from such mines.

The situation calls for some drastic remedy. I have seen cars pass through on the railroad, loaded with what was shipped for coal, and do not hesitate to say that I would not use the stuff they contained, for making a wagon road. There was mixed with the coal much mud and soft shale that already showed the disintegrating effects of the weather. In my opinion, these smaller mines, guilty of making such shipments, should be closed down and any good miners found in them should be sent to other mines where the quality of the coal is satisfactory and it is possible to mine the coal without mixing with it bone and slate.

W. R. JONES,
Ohiopyle, Penn. General Foreman

Storage-Battery Locomotives

Letter No. 1—Since the publication of a number of articles in *Coal Age*, some time since, regarding the peculiar adaptation of the type of locomotive known as the "storage-battery type," little has been heard in regard to the performance of these machines in the mines. In the hope of learning the results that have attended their use, let me ask that those who have operated such machines submit their opinions through *Coal Age*.

During the past two years, I understand that great progress has been made in developing this particular type of mine locomotive, which has now passed the experimental stage and fully earned its right to stay in the mine. We all remember the struggle experienced in the attempt, a few years ago, to introduce electrical machinery in mine haulage. There were many obstacles to be overcome, to say nothing of prejudices that had to be set aside; but, today, the most up-to-date mines in the country are electrically equipped.

THE STORAGE-BATTERY LOCOMOTIVE SPEEDILY COMING INTO ITS OWN

The attempted introduction of a storage-battery locomotive, in mine haulage, likewise, has had its difficulties and prejudices to overcome; and, to the close observer, it is remarkable how rapidly this type of locomotive has come into popular favor, since it was first brought to the attention of coal operators.

While some of the manufacturers of old-line mining machines and equipment have not given this branch of the service the attention it deserves, it has not been because they have failed to recognize its growing importance. Such has been the demand for mining equipment that manufacturers have been overrun with business in their standard lines, and have not had the time to devote to making the changes required in the building of new types of machinery.

On the other hand, some of the newer companies have devoted their entire attention and energies to the building of storage-battery locomotives. One in particular, has specialized on this class of equipment, with the result that it is shipping one locomotive a day and is unable to catch up with its orders for these machines.

To the observer who has watched its progress, the conviction is firm that this type of locomotive will soon replace all other methods of gathering coal in mines. This opinion is based on the fact that the storage-battery machine works independently, which enables it to go to the face of any room or heading, or enter any place where track is laid.

Much credit is due to the zeal and effective work of the battery companies who have set themselves to the development of a long-life battery that would be suitable for mine service. One company now furnishes a battery for which they claim a life of five or ten years, which is an important factor in the reduction of cost of maintenance. From the start, the question of a suitable battery has been the main consideration.

OPERATORS WANT FACTS SHOWING PERFORMANCE

My experience, in recently passing through the mining districts of West Virginia and Kentucky, proves to me that operators are greatly interested in getting the facts relating to the performance of storage-battery machines. They freely admit the advantage of such a machine for haulage purposes, especially for the work of gathering coal at the face. On every hand, I hear the statement that in a short time this locomotive will be found in every mine.

Since no trolley wire or rail bonding is required for its operation, the storage-battery machine has proved very popular in the development of a new mine, as a small generating unit only is required, in such cases, for charging the batteries. In the later development of the mine, the storage-battery machine can be used in the gathering service, and a larger machine installed for the main-line work.

Another instance where storage-battery locomotives have proved of advantage is where alternating current is being used in the mine, for operating coal-cutting machines. A small unit can then be installed for charging the battery, since 6 or 7½ kw. is an ample charge for a 5- or 6-ton locomotive, as this eliminates the necessity of installing a high-priced substation. The flexibility of the storage-battery machine makes it adapted to conditions where other equipment could not be used. From the standpoints of safety and economy, this type of locomotive is superior to the old trolley type.

Pittsburgh, Penn.

ENGINEER.

Mine Cars

Letter No. 2—Referring to the interesting letter of L. B. Paul, *Coal Age*, Feb. 16, p. 346, I want to endorse what he has said about its being practicable to use roller-bearing cars in the same mine and at the same time with plain-bearing equipment. Of course, it is willingly admitted that the most satisfactory results can only be obtained when the entire mine is equipped with roller-bearing cars; but there are many things to be considered before an entire change of equipment can be advocated.

If the mine is one that is about to start operation, it is an easy matter then to install either plain-bearing or roller-bearing equipment as the desire and ability of the operator may determine. But, consider for a moment a mine in full operation and using, say 300 cars, equipped with plain bearings. In my opinion, no difficulty should be experienced in changing the type of bearing on 50 of these cars, which would require a comparatively small outlay.

COMPARATIVE TESTS SHOW SUPERIORITY

After changing the bearings on these cars, they should be operated, as far as practicable, on the same trip or section with plain-bearing cars, so that comparative notes can be made in regard to the force or power required to move each type of cars. Such a comparison will enable the operator to determine whether or not it will pay to make the same change in the balance of his equipment. But, in every case, the decision cannot fail to be in favor of the roller-bearing equipment; and orders will be quickly given to change the balance of the car bearings, a few at a time. By the end of the year, probably, the entire rolling stock will be equipped with roller bearings.

This method of proceeding has been in use in a large number of operations in the bituminous field of Pennsylvania, where plain bearings are rapidly giving place to roller bearings for car wheels. To my personal knowledge, none of these operations have been inconvenienced at all while making the change.

EFFECT OF MIXED EQUIPMENT

Mixing the two types of equipment on the same haul does not, in any way, hold up the production of the mine. On the contrary, it has been found that the daily output has been much increased. As Mr. Paul says, the miners soon discover the easy-running cars.

At the present time, when every operation is confronted, not only with a shortage of labor, but with the necessity of paying a higher price for mining and other work, it behooves the management to study carefully every feature that promises to reduce operating costs and increase the efficiency of the men in the mine. This practice is occupying the mind and thought of every successful operator in the anthracite and bituminous regions and its importance is growing every day.

Pittsburgh, Penn.

J. M. KELLY.

Letter No. 3—I was interested, in the reading of L. B. Paul's letter on Mine Cars, *Coal Age*, Feb. 16, p. 346, to note that he takes issue with H. M. Crankshaw, who claimed in a previous article, Jan. 26, p. 191, that "It does not pay to mix roller-bearing cars with other rolling stock." If I am not mistaken, Mr. Paul's experience has been obtained in the anthracite fields, but the practice is the same in the bituminous fields throughout the country.

The question of underground haulage is an important factor in the production of coal. Inefficient equipment has a paralyzing effect on the mine's production, and operators generally are giving this question favorable attention. Knowing the great advantage derived from the use of roller bearings on mine cars, manufacturers of this class of equipment, by advertising and other

means, have not failed to impress coal operators with its importance.

Tests of flexible-roller bearings, which is the type most widely used in mines, have shown that by the use of such bearings the power consumption is very materially reduced. It is also claimed that the expense for lubrication is greatly lessened. Similar claims have been made by the manufacturers of other types of bearings, however; and the only way the operator can determine for himself the superiority of either type is by actual comparison under the same conditions.

In order that this may be done, the roller-bearing and plain-bearing cars must both be in operation, under the same conditions. In other words, the equipment must be mixed for a time at least, until it can be determined which type of bearing will give the best service in that mine. No operator will care to change his entire equipment without having first made such a comparative test.

STORAGE-BATTERY LOCOMOTIVES AND ROLLER-BEARING CARS

In connection with the growing tendency of operators to install storage-battery locomotives, on the gathering haul in mines, it is worthy of note that the use of plain-bearing cars will often cause a heavy discharge from the battery, owing to the large increase of track resistance. Where such heavy discharges are liable to occur, it may become necessary to recharge the locomotive before the close of the shift, which would mean much annoyance and delay.

Speaking of the saving of power, it must be remembered that the greatest saving is effected on a level track. The saving accomplished at a time when hauling a loaded trip of cars up a considerable grade is small in comparison with the gain on a level track, for the reason that the grade resistance has increased so much as to overshadow the smaller gain resulting from the use of roller bearings, which therefore represents a much smaller percentage of saving on a grade, than when the cars are hauled on a level track. However, it is easy to show a considerable power saving when hauling on grades up to 5 and 6 per cent., with roller-bearing cars.

COMPARATIVE COST OF LUBRICATION

Speaking of the saving in expense for lubrication, it is necessary to make the same comparative tests, in order to determine the superiority of roller bearings, in this respect also. For example, mine-car oil or, as it is better known, "black strap," runs 50 gal. per bbl., and costs, at this time, about 15c. per gal. Grease for roller bearing mine cars weighs 400 lb. per bbl. and costs approximately 10c. per pound.

The average plain-bearing wheel will consume about one pint of black strap in the performance of the same work, where the average roller-bearing wheel will consume about one pound of grease. Since there are 400 pts. in 50 gal., a barrel of black strap will lubricate as many cars as a barrel of grease weighing 400 pounds.

The advantage in respect to lubrication, however, is due to the fact that plain-bearing cars that have been in service for a year or so require lubrication every day, or at least four times a week, or 208 times in a year. At a cost of 8c. per car, for each oiling, this would mean a total yearly cost of \$16.64 per car.

Comparing this with the lubrication of roller-bearing cars, regardless of whether they have been in service six months or six years, such a car will not require to be lubricated oftener than once in three months, or four times a year, and some cars have run for a longer interval without causing trouble. The cost for lubricating a car of this type is 40c., making a total of \$1.60 per car per year. Allow me to state, in this connection, that a roller bearing never needs the full amount of grease to fill the reservoir, after the first greasing.

Again, the oiling of plain-bearing cars requires the services of an oil boy, each day the mine is running; and, under present conditions, his pay is \$3 per day. If the mine works 300 days in a year, the labor charge for this work is \$900, in that time. In the lubrication of roller-bearing cars, this labor is only required when the cars are being oiled or once in three months. Results show that, at the average mine, 12 days of labor, per year, is required to grease the cars, making a total labor cost, for this work, \$36 per year.

A study of these figures is sufficient to convince anyone that the use of roller-bearing mine cars effects a great saving in the cost of operation. Foremen know that miners are prone to insist upon receiving some consideration when they are given cars that push as hard when empty as others do when loaded.

The claim that the mixing of these two types of bearings in the equipment of a mine causes any inconvenience is not founded on fact; but the difference, whatever it may be, serves to argue in favor of roller bearings.

Operators who have made the change from plain bearings to roller bearings, after being convinced by a test of the latter, for a few months, have found that the entire change can be made, in some mines, in a few months, while in others it may take a couple of years, depending on the size of the operation and the financial condition of the company.

EXPERIENCE.

Johnstown, Penn.

Wagon Mines vs. Patriotism

Letter No. 5—I was much interested in reading the last letter of Thomas Hogarth on this subject, *Coal Age*, Jan. 19, p. 158. Judging from his remarks, I would consider Mr. Hogarth to be a broad-minded man of long experience in coal mining and possessed of democratic views. At the same time I must admit that he regards the subject from a different angle and reaches a different conclusion from my own.

In many localities the small wagon mine is a blessing to the country and should be encouraged. The product of these mines is generally consumed in the neighboring locality with the result that freight charges and profits of the middleman are eliminated, and the farmer and local consumer pay less for their fuel supply.

In the operation of these small mines it occasionally happens that the output exceeds the demand, and the operator finds that he can ship one or two flats if permitted to load them on the railroad switch. In justice to him let me say it is my opinion that the railroads should supply the flats for that purpose. It is true that the loading of a car, here, may take a little longer time than would be required at a larger mine, but the teams and men employed to haul the coal from the mine to the track would mostly be idle if not thus

engaged. Supplying the flats needed at such mines will keep them running and enable them to supply the local trade, which will lift that burden from the railroad. It must be admitted that the time lost in unloading a car is probably as great as or greater than that which would be lost in loading the same for shipment.

Someone has suggested that all miners should be located where they could do their best work in digging coal. In reply to this remark, however, let me say that the small mines offer a greater advantage in this respect than the larger mines where the miner is often subjected to much delay due to causes beyond his control. The wage scale paid at the small mine is generally the same as that at a larger mine, and the miner is able to produce as much or more coal in the former as in the latter.

Recently I had an opportunity to compare the tonnage, per man per day, in pick and machine mines. I found that the machine loaders averaged from 7 to 8 tons per man per day in a 5½-ft. seam, while pick miners averaged about 8 tons per man per day in a seam varying from 4 to 6 ft. in thickness. This difference is explained partly by the fact that all good and experienced miners in time work their way into pick mines, leaving men of generally less experience in the machine mines. Moreover, it frequently happens that, in machine mining, the miner finds his coal has not been cut and is obliged to go home for that day.

In addition to what I have mentioned there are numerous causes of delay in a large mine equipped with mechanical haulage. The workings are more extended, which increases the opportunity for delay, owing to falls on the roads, breakage of machinery, or the mine being thrown idle as a result of the careless act of one of the men. Delays from these causes are of far less frequency in a small mine employing but a few men.

R. J. PICKETT.

Shelburn, Ind.

Influence of Ash Content of Coal

Letter No. 1—The interesting article, by Frank G. Philo, relating to the influence of the ash content of coal on its fuel value, published in *Coal Age*, Mar. 2, p. 415, calls to mind some investigations we made of the same nature.

As the article dealt with anthracite coal and our investigations considered bituminous coals exclusively, it may prove of interest to compare the results of the two findings. We undertook to ascertain the exact relationship between the ash content and the value of the coal under our conditions of operation. The relationship discovered is believed to hold closely in the average plant.

Most contracts for coal purchased upon the basis of its heating value are predicated upon the hypothesis that the value of the coal closely approximates the value indicated by the calorimeter. Practically all of such contracts seem to recognize that the ash content influences this value and they penalize an excess of ash. No contract under the writer's attention has attempted to penalize the ash content on any other than an empirical basis, and the article referred to is the first seen that has attempted the solution of the problem.

Our starting point was the proven fact, as stated in a bulletin of the coal-testing plant of the Government,

that a coal with an ash content as high as 40 per cent. was worthless as it was difficult, if not impossible, to keep it ignited in an ordinary furnace. We have had no such coals, but have had them approximating 30 per cent., and the results lead us to assume the correctness of the Government report.

Coal apparently follows a straight line characteristic, as regards its value in the calorimeter on a basis of its ash content, assuming the same character of coal, and a nearly straight line though at a different angle, as regards its usable value in the furnace. This last curve drops a little as the ash content nears 30 per cent., beginning to drop at about 20 per cent., and presumably this increases in curvature toward the point of zero value. These results seem similar to those for anthracite coal in the previously mentioned article.

THE PERSONAL EQUATION OF THE FIREMAN

Since the personal equation of the fireman greatly affects the results obtained from the same coal on two successive days or different parts of the same day, it is difficult to keep all of the factors the same in a combustion test and the results are approximate at best.

It is also remarkable to note the closeness of the formula we have been using to evaluate our coal to the results obtained by Mr. Philo. Because the curve begins to drop rather rapidly between 20 and 30 per cent. ash and in practice we use coals having an ash content of 15 per cent. or less, we have settled upon 1½ per cent. depreciation in the coal value for each 1 per cent. of ash content; we reject as worthless for our uses any coal above 15 per cent. Were we closer to the coal fields, with consequent lower rate on coal freight, it would probably pay us to consider coals with higher ash content, but under our conditions we cannot afford to pay freight on the ash.

In practice, then, in estimating the probable value of coal, we use the formula:

$$\text{Value of coal} = \frac{C + F + U}{B.t.u. - (B.t.u. \times 1\frac{1}{2} \text{ ash per cent.})}$$

where

C = Cost of coal at mine per ton;

F = Freight rate per ton;

U = Unloading cost per ton;

$B.t.u.$ = Heat value by calorimeter per ton.

Considering the fireman and the inability to keep our conditions exactly constant, this formula gives us results as nearly correct as we can determine. In other words, the errors caused by its use are well within the errors of observation and measuring instruments.

Selma, Ala.

FUEL ENGINEER

Opening New Mines

Letter No. 1—After reading the interesting article of A. C. Watts, entitled "Coal Mining in Utah, During 1917," *Coal Age*, Jan. 26, p. 174, I am led to question the remarks made by Mr. Watts on page 177.

In speaking of the effect that the opening of new mines will have on the coal industry of the state, it appears to me that the gist of his remarks convey the idea that such undertakings should be discouraged owing to two essential reasons: (1) The present limitation of transportation facilities. (2) The shortage of

skilled labor in mines. There can be no doubt but that these two conditions prevail generally throughout the country, at the present time. The question, however, of how far these conditions should be permitted to curtail development work in coal mining is open to argument.

A company known as the Iron County Coal Co., owning property located near Cedar City, in Iron County, Utah, has just commenced the installation of a two-mile gravity tram, for the purpose of transporting the coal mined in their new opening to nearby towns, lying off the main line, in the southwest section of the state. Coal is now brought to these towns from mines several hundred miles farther away than the coal property at Cedar City.

DISCUSSION IS INVITED

Viewed from either an economic or a patriotic standpoint, I would like to hear the opinions of *Coal Age* readers, in regard to the suggestion that such new developments should be discouraged. In other words, is there any ground for condemning the undertaking of the Iron County Coal Co., in opening a new mine at Cedar City to supply a particular market that has heretofore obtained its coal from a distance of several hundred miles?

In Iron County, where the new mine is to be started, the coal measures outcrop at an elevation of 2000 ft. above the town, the coal seam itself lying practically flat. Under these conditions, no large expenditure for development work of the nature of shafts or slopes will be required, and little mining equipment will be needed in the operation of the mine. The greatest expenditure is the installation of the two-mile gravity tram connecting the drift opening with the towns further down the valley where the coal is to be delivered. To my mind, there is every reason why such an undertaking should be heartily encouraged and I see no reason to the contrary.

To supply the towns in question with the coal that they require will take a fewer number of railroad cars than when it is necessary to transport the same amount of coal a greater distance, inasmuch as the coal would then be a longer time in transit. The proposed gravity tramway will greatly relieve the transportation on the main roads and those tracks can be utilized wholly for carrying coal to other districts.

There is an abundance of labor in the local field mentioned that will be available in the new undertaking, and there will be no need of calling workmen from other mines where they are employed. Taking these things into consideration, it appears to me that it is not only good business economy, but good patriotism as well, to encourage the investment of capital in the opening up of such local properties, and I shall be glad to hear from others on this question.

J. L. DONAHUE.

Salt Lake City, Utah.

Surveying and Mapping

Letter No. 4—After reading the several letters that have appeared in *Coal Age*, on the subject of surveying and mapping, it seems to me that an engineer's familiarity with one or another method of numbering survey stations will determine which system he will adopt. While one will prefer to number all survey stations in

the mine, starting from zero at the foot of the shaft or slope, another will prefer to number each pair of cross-entries or section of the mine separately, starting from zero at the mouth of each pair of entries.

Having had considerable experience with both of these methods of numbering, it is my belief that each possesses its particular advantages. First, it must be clearly understood that the stations referred to are generally taken to mean transit points and not the hundred-foot points spoken of in connection with taking grade levels.

The consecutive numbering system certainly possesses the advantage that a newcomer can locate a given station with greater certainty and find the same in the notes more quickly, than where each pair of entries has its own set of numbers. However, I fail to see that there is any uncertainty in establishing the correct location of a given station when it is known on which entry the station occurs. It is rare, indeed, that one or more of the members of a surveying party is not familiar with the mine and can lead the way to the entries in question. In regard to grades, the level pluses shown on the map will clearly indicate the desired distances and enable the grade to be ascertained.

NEED TO ESTABLISH RELIABLE REFERENCE POINTS

In this connection allow me to mention an important point that has not as yet received attention. This is the need of establishing permanent survey points at or near the mine opening, to which reference can be made later as the need may require. It has been my experience that this has generally been neglected by engineers when making the original survey of the mine. The need of such reference points close to the mouth of the mine is often not realized until it is found that the original stakes of the surface survey have been destroyed, and it is necessary to run lines from distant points on the surface to connect with what points can be found in the mine.

In one instance that I recall it became necessary to reestablish connection on the surface 15 years after the original survey had been made. In that case three weeks was consumed in making the connection. This could have been accomplished in a short time had good reference points been maintained at the mine entrance. We were fortunate, however, in making the connection when we did, since shortly after this was done the original stakes were destroyed. I recall two similar cases, in one of which two weeks' time was consumed and in the other three weeks, in making connection between the points in the mine and the original stakes on the surface.

Let me suggest that the reference points near the mine entrance should be three in number and form a triangle, being about 300 ft. apart. I have found that old car-axles make good stations or monuments for this purpose. A collar should be shrunk on one end, while the other end of the axle is pointed to permit of its being driven in the ground. After driving such a monument in place, a center hole should be drilled in the end of the axle to indicate the exact point or station. The head of the monument should then be thickly covered with white lead to preserve it from injury.

Piney Fork, Ohio.

F. C. SANNER.

INQUIRIES OF GENERAL INTEREST

Regulator Calculation

Awhile ago an examination question was answered in *Coal Age* [Vol 9, p. 771], and it seemed to me that the result obtained was incorrect. The question read as follows:

Ques.—A mine has 50,000 cu.ft. of air, under a 2-in. water gage, passing in two equal splits 6 x 10 ft. in section and 10,000 ft. long. It is proposed to divide this air so that only 15,000 cu.ft. will be allowed to the one split. State how this can be accomplished and the size of the opening required.

Kindly explain in what way the following solution is wrong: Since the quantity of air passing in one of these splits is to be reduced to 15,000 cu.ft. per min., the rubbing surface being $10,000 \times 2(6 + 10) = 320,000$ sq.ft. and the sectional area $6 \times 10 = 60$ sq.ft., the water gage due to the friction of the air in that split is found thus:

$$w.g. = \frac{k s q^2}{5.2 a^3} = \frac{0.00000002 \times 320,000 \times 15,000^2}{5.2 \times 60^3} = 1.28 \text{ in.}$$

Then, subtracting this result from the original water gage gives for the water gage due to the regulator, $2 - 1.28 = 0.72$ in. This would give, for the area of opening in the regulator

$$A = \frac{0.0004 q}{\sqrt{w.g.}} = \frac{0.0004 \times 15,000}{\sqrt{0.72}} = \text{say } 7 \text{ sq.ft.}$$

The answer given by *Coal Age* to this question is 4.68 sq.ft. Please explain where my trouble lies.

Fernie, B. C., Canada.

JOHN BELL.

The solution given by this correspondent ignores the fact that the placing of the regulator in one of the splits, for the purpose of reducing the quantity of air passing in that split to 15,000 cu.ft., has the effect to increase the water gage in the main airway and reduce the total quantity of air in circulation.

As explained in the answer given to this question on page 771, and to which reference has been made, it is necessary to assume that the power on the air remains unchanged. This being the case, the unit pressure or the pressure per square foot of sectional area will vary inversely as the quantity of air in circulation. That is to say, as the pressure or water gage is increased by the placing of the regulator, the quantity of air circulated by a constant power will be decreased in the same proportion.

In the solution given, it was found by trial that when the quantity of air passing in the regulator split was reduced to 15,000 cu.ft. per min., the total quantity of air passing in the main airway was reduced from 50,000 to 42,200 cu.ft. per min.

The increase in water gage must be calculated from the increased quantity of air passing in the open split, which is $42,200 - 15,000 = 27,200$ cu.ft. per min. Then, since the water gage in the open split varies with

the square of the quantity of air in circulation, the increase in water gage is in the ratio $(27,200/25,000)^2 = 1.088^2 = 1.18+$, and the increased water gage is therefore $2 \times 1.18 = 2.36$ in.

In order to calculate the water gage due to the regulator, it is necessary to ascertain how much the original water gage of 2 in. is lowered when the air traveling in that split is reduced from 25,000 to 15,000 cu.ft. per min. Since the water gage varies with the square of the quantity of air passing, the natural water gage, or the gage due to friction, in the regulator split, is $2(15/25)^2 = 2(3/5)^2 = 2 \times 9/25 = 0.72$ in. The water gage due to the regulator is, therefore, $2.36 - 0.72 = 1.64$ in., and the area of the opening in the regulator, as calculated on page 771, is 4.68 sq.ft.

It will be observed that the size and length of the airways, given in this question, do not enter the solution. The question states that a water gage of 2 in. was required to pass 50,000 cu.ft. of air per min. in the two equal splits. As a matter of fact, assuming the usual coefficient of friction, $k = 0.00000002$, the water gage required to pass 50,000 cu.ft. of air per min. in the two splits given in this question would be

$$w.g. = \frac{0.00000002 \times 640,000 \times 50,000^2}{5.2(2 \times 60)^3} = 3.56 \text{ in.}$$

This shows that if the given quantity of air was circulated in the two splits mentioned, under a water gage of 2 in., the coefficient of friction used was probably the old Fairley coefficient, $k = 0.00000001$. This, however, does not affect the solution of the question, which is as given on page 771.

Accumulation of Mine Gases

Kindly explain the reason for the accumulation of gases in mines, and state why these gases do not diffuse rapidly into the air, as we are taught they do, in all mining textbooks.

T. W. MOLANEY.

Avella, Penn.

The reason for the accumulation of gas at the working face and in cavities and other void places in mines is that they are generated, or issue from the strata, more rapidly than they diffuse into the air. The diffusion of gases varies inversely as the square roots of their densities; and, as the density of the layer of gas in contact with the air closely approximates the density of the air itself, it follows that diffusion at the point of contact is very slow.

In order that diffusion shall continue to be rapid, it is necessary that fresh surfaces of contact between the gas and the air shall be constantly maintained, which requires that the air and gas shall be kept in motion. For this reason, diffusion takes place more rapidly in a place where a good air current is moving. On the other hand, diffusion is very slow in a poorly ventilated place.

EXAMINATION QUESTIONS

Indiana Firebosses' Examination, Vincennes, Jan. 17, 1918

(Answered by Request)

Ques.—(a) What is a safety lamp? (b) Describe the essential features on which a safety lamp is based.

Ans.—(a) A safety lamp is one in which the lamp flame is inclosed in a chimney of wire gauze or a glass cylinder surmounted by a wire-gauze chimney. It is so arranged that no air can enter the combustion chamber of the lamp or pass out through the chimney, except by passing through the mesh of the wire gauze, which must be arranged to protect all openings admitting air to the lamp.

The gas-charged air surrounding the lamp enters the combustion chamber and the gas is permitted to burn within the lamp chimney, but the flame is prevented from passing out of the chimney, by the cooling effect exerted by the wire gauze with which the burning gas must come in contact in its outward passage.

(b) The essential features of a properly constructed safety lamp are its simplicity of construction and good workmanship, by which all parts are made to fit tightly together, and these should so depend on each other that the lamp cannot be put together with any part omitted. All openings to the lamp must be protected by wire gauze, of standard mesh, containing 784 openings to the square inch.

For testing purposes, the lamp should be sensitive to gas; the air should enter at a point below the flame and pass out through the upper part of the chimney. A good working lamp must give a good light; the gauze chimney must be protected by a bonnet; the lamp should be simple in construction and capable of withstanding rough usage, besides being light and portable. A working lamp should be protected by a lock fastening that will show any attempt to tamper with the same.

Ques.—Supposing there are 20 men working in rooms off the 3- and 4-E off the main north and, in making an examination as fireboss, in the morning, you found a large accumulation of gas in rooms Nos. 2, 3 and 4, off the 4-E, the same being the intake; how would you proceed to remove the gas and what precautions would you take to prevent an accident?

Ans.—The gas being found, in this case, near the mouth of the intake of this section of the mine, all the men should be notified and withdrawn from this pair of entries, before any attempt is made to dislodge the gas. Having withdrawn the men from this section, proceed to increase the circulation of air in these two headings, as far as practicable.

If it is possible to short-circuit the air at any point between the mouth and the head of these entries by setting open a door, let this be done. At the same time, hang a piece of canvas on the intake airway, just inby from the point where the air current is short-cir-

cuted and passes into the return. This will prevent the gas from being carried to the face of the heading, by conducting it directly into the return airway.

Now, beginning at No. 2 room on the 4-N, hang a canvas just inby of the mouth of this room, to deflect the air current into the room. Use safety lamps only, and watch these carefully to observe the progress being made in the removal of the gas, which should pass out through rooms Nos. 3 and 4. When the gas is cleared from No. 2 room, move the canvas on the entry to a point just inby of the mouth of No. 3 room, thereby forcing the air up Nos. 2 and 3 rooms.

If no gas was found in room No. 5, and those following, a canvas should be hung in the inby breakthrough connecting rooms 4 and 5 near the face. In this manner, continue to drive the gas from the three rooms where it was found accumulated and allow it to pass out on the headings without permitting it to enter the rooms, as far as this is practicable and possible. In the performance of this work, only competent men should be employed, and all entrances to the return air current should be properly guarded to prevent anyone from entering the return current.

Ques.—How would you render first aid to a person suffering from an electric shock?

Ans.—It is important, first, to see that the person is not in contact with the live wire that has produced the shock. If it is found that he is still in contact with the wire he must be removed from it as speedily as possible and in a manner that will not affect the rescuer.

Send for a doctor at once. Then proceed to apply the Schaefer method of resuscitation, by turning the victim over so that he will lie on his stomach. Rest his forehead on a coat that has been folded up to form a pillow, or on one of his arms and turn the face slightly to one side so that the ground will not obstruct his breathing. See that the mouth is clear of any obstruction and that the tongue is pulled forward so that it does not impede the passage of air through the throat.

No time should be lost, but, as far as practicable, the patient should be given the advantage of the best air available. Now, kneel astraddle of the man's thigh in a position facing his head and resting both hands on his loins with the fingers spread over the lower ribs, swing forward, thereby throwing the weight of the body gradually and without violence upon the patient. Again, swing back and repeat this to-and-fro movement at the rate of about twelve or fifteen times a minute, imitating the action of breathing. Continue this for the space of two hours or more, or until a doctor has pronounced the man dead.

Ques.—How would you render first-aid to a person overcome by mine gases?

Ans.—Remove the person at once to fresh air. Loosen the clothing about the chest and abdomen and sprinkle cold water on the face and chest. Then give artificial respiration in the manner just described.

COAL AND COKE NEWS

What Happened in February

- Feb. 1—Explosion at Mine No. 21 of Peabody Coal Co., Stonington, Ill., kills three men. General committee of anthracite operators formed to regulate anthracite industry.
- Feb. 2—Dr. Garfield announces that he may do away with workless Mondays.
- Feb. 4—Anthracite committee formed Feb. 1 makes report.—In Drumbeller field, Alberta, Canada, 2000 men go on strike to enforce closed shop.—Dominion Coal Co. makes an agreement with its men.
- Feb. 5—Meeting of state fuel administrators of the East and Michigan at which question of closing down on Mondays is considered with Federal Fuel Administrator.—Order in Council passed by Canadian cabinet suspending operation of all manufacturing plants in Canada Feb. 9-11, closing country clubs during February and March and theaters on Mondays from Feb. 18 to Mar. 25.—J. E. Roderick, chief of Pennsylvania Department of Mines, dies.
- Feb. 6—A. C. Campbell and Tudor Williams, fuel administrators in Luzerne and Lackawanna Counties, order the operators in the anthracite region to prepare their coal, as in former days, with breakers and washeries.
- Feb. 7—Senator Overman introduces a bill providing that the President may coordinate and consolidate executive bureaus, agencies and offices, this power to continue for one year after the war.—Prices are increased 40c. per ton for run-of-mine, prepared sizes and slack at the mines in Maryland and in Mineral, Grant and Tucker Counties and a part of Preston County, West Virginia. The same increase is conceded in the Kenova and Thacker fields in Mingo County, the extreme southern part of Wayne County, the extreme northeastern part of McDowell County, West Virginia, and the extreme northern part of Buchanan County, Virginia. All these rates may be increased 45c. per ton more if the terms of the Washington agreement have been complied with. The rates before the Washington agreement was accepted were: Run-of-mine, \$2, prepared sizes, \$2.25; slack, \$1.75.—Fuel Administrator declares that the "heatless" Mondays must continue a little longer.—Secretary McAdoo offers a half billion dollars worth of Treasury certificates for purchase and says that the offer will be repeated every two weeks.—Members of the mine cave committee of the Civic Bureau of the Scranton Board of Trade meet with railroad presidents and heads of coal companies in New York City.—Strike at Broadwell colliery of the Lehigh Valley Coal Co., at Moosic.
- Feb. 8—War Department refuses request of Fuel Administration to exempt mine workers.—Price of Pennsylvania crude oil set at \$4 a barrel, an advance of 25c. Change has apparently the approval of the Fuel Administration. Corning set at \$2.85. Cabell at \$2.77, Somerset at \$2.60. Ragland at \$1.25, advances of 5c. per barrel.—Fuel Administrator lifts Monday closing order from North Carolina, Tennessee, South Carolina, Georgia, Florida, Alabama, Mississippi and Louisiana and gives power to state fuel administrators to withhold coal as well as to divert it.—Dr. H. A. Garfield, United States Fuel Administrator, refuses to Alabama the increase of 45c. per ton in the price of coal granted in other regions.
- Feb. 11—L. A. Sneed, in charge of appointment and distribution, is appointed assistant to the United States Fuel Administrator with duties similar to those in the office he vacates.
- Feb. 12—Chairman William J. Harris, of the Federal Trade Commission, resigns.—Tippie No. 5 of the Jackson Hill Coal and Coke Co. is burned in a fire believed to be incendiary.
- Feb. 13—Explosion of gas at a Lehigh Coal and Navigation colliery injures four men.—Fuel Administration announces that as the coal situation has improved the fuel restrictions on Mondays will hereafter be removed.
- Feb. 14—Fuel Administrators of New England declare that under powers delegated to them by the National Fuel Administrator next Monday will continue as a holiday in New England except perhaps in New Hampshire. (New Hampshire was later included.)—Big strike commences in the Alabama field at mines of Tennessee Coal, Iron and Railroad Co. and on Feb. 15 extends to Republic Iron and Steel Company.
- Feb. 15—The President orders that licenses be obtained for all imports and exports to foreign countries.—Judge Strauss, of Luzerne County, Pennsylvania, reverses decision of Workmen's Compensation Board of that state declaring that the negligent act of an employee does not defeat his right of compensation.—Fuel Administration order, under which smelting coal is put at the same price as prepared sizes of bituminous coal, goes into effect.
- Feb. 17—Ten members of the National Board of Labor named. Two more will be chosen by National Industrial Conference Board and the American Federation of Labor.
- Feb. 18—Coke prices revised by Fuel Administration in certain coke districts of Georgia, Alabama, West Virginia and Oklahoma.—Fuel Administration orders that prices shall be the same for the same kind of coal whether sold by operator or jobber.
- Feb. 18-21—New York meeting of American Institute of Mining Engineers.
- Feb. 19—President Wilson writes to W. G. McAdoo, Director of Railroads and Secretary of the Treasury, in reply to his letter of Feb. 18, authorizing him to urge on state officials that it is their duty to obtain increased rates for public service wherever public-utility corporations are suffering from the increased labor, fuel and equipment charges.
- Feb. 20—Texas and Montana notify the Fuel Administration that they will take care of their own fuel needs during the war. Anthracite is barred entirely in Montana.—The Fuel Administration classifies coal consumers into four groups with priority in coal delivery in accordance with their importance. Group 1 includes households, ships, railroads, public utilities and public institutions; Group 2, necessary war industries; Group 3, necessary peace industries; and Group 4, the so-called makers of luxuries.—Frank J. Hayes, president United Mine Workers of America, orders mine workers in Alabama to go back to work.
- Feb. 21—Fuel Administration fixes price of diverted coal. It is to be either the Government price or the contract price at the option of the owner of the coal thus diverted at the time of diversion.
- Feb. 22—By an explosion of 28 cases of powder at the Royal colliery at Virden 4 men were killed.
- Feb. 23—Fuel Administrators of Maine, Rhode Island, New Hampshire, Vermont, Connecticut and Massachusetts have decided to suspend "heatless Monday" under the United States Fuel Administration order of Jan. 17.—A. W. Calloway, of the Davis Coal and Coke Co. and the Terminal Railroad Coal Co., is appointed Director of Bituminous Coal Distribution.—E. R. Stettinius made one of the Assistant Secretaries of War.—Four shot-firers are killed in an explosion at the mines of the Citizens Coal Co., at Springfield.
- Feb. 26—The Fuel Administration demands greater coal conservation.—Bernard Baruch made chairman of the War Industries Board.—Senator Reed attacks the Fuel Administration in the Senate.
- Feb. 27—Frank P. Walsh chosen by American Federation of Labor to serve on the National Board of Labor.—Prices of coal produced on Tug River, West Virginia, west of Welch to Panther, including branches except Newhall, Berwind, Canebreak and Hartwell: Run-of-mine, \$2.40, prepared sizes, \$2.65, slack, \$2.15, an increase of 40c. per ton. The "Upper Clinch" prices in Virginia are raised 50c. per ton and are 10c. higher than those above quoted. All are subject to a further 45c. increase where Washington agreement is accepted.—Independent Union of Miners of America organized.

Feb. 28—Fuel Administration orders that where cannel and bituminous coal is mixed the Government price for bituminous shall govern.

Correction—Instead of 87 lives being lost in the Stellarton explosion as stated in "What Happened in January," published Feb. 9, the correct number ultimately proved to be 86.

Harrisburg, Penn.

Judge McCarrell, of the Dauphin County court, on Mar. 8 ruled that under existing state laws it is not a crime to sell coal by short weight, provided the scales used are tested and corrected. Lawyers declare the ruling amounts to a conclusion that giving short weight is in error and that persons seeking redress under state statutes must go through the civil and not criminal courts. Judge McCarrell's ruling is that the weights and measures act contains no penalty for short weighing in any sale, but merely for use of fraudulent scales. The Dauphin judge's decision will be carried immediately to the upper courts for a final ruling.

The State Compensation Board has declined to rule that Jerry Willis, of Altoona, a claimant against the Altoona Coal and Coke Co., sustained a total loss of a hand when he had only part of a hand to lose. Willis was injured 30 years ago and lost four fingers at the knuckle joint and his thumb at his first joint, but developed much dexterity with what remained and worked as a carpenter and in other occupations. Last year as a result of an accident the remainder of his thumb and the palm of his injured hand were amputated. The Board has modified the award made so that it will terminate when Willis "shall have acquired an earning capacity."

Four coal companies operating in Clearfield County on Mar. 7 charged in a complaint filed with the Public Service Commission that the Pittsburgh & Susquehanna R.R. had allowed its line to get into such a state of disrepair that operation was attended by accidents and that money secured under promises of repair had not been expended for maintenance. It was also charged that when a bonus was refused operations were interrupted. The commission will inaugurate an inquiry at once as the coal companies declare they are dependent on the road for transportation.

The first indictments for alleged profiteering in the eastern district of Pennsylvania were returned by the Federal Grand Jury on Mar. 9. They charge the Orr Coal Mining Co. of Clarksburg, W. Va., and James M. Orr, president of the company, with asking prices in excess of those fixed by President Wilson. The Government alleges that the company billed bituminous coal to consumers in this state at the prices fixed by the Federal regulations, but under secret arrangement with certain customers an additional sum of 73c. to \$1 a ton was collected by Charles T. Schectman, the Philadelphia representative. The technical charge against the company is asking higher prices than those fixed by the regulation, and against Orr of conspiracy to ask higher prices.

The method used, it is said, was to have an understanding with manufacturing plants that the receipted bills would disclose only the regulation price and that the excess could be paid in cash. Four companies in Philadelphia and vicinity paid heavy excesses, according to the indictment.

These companies, a Government official said, consented to pay the excess because of the necessity of having fuel to keep their plants in operation. The trial of Orr and the mining company has been tentatively fixed for Mar. 25.

The miners' examining boards for Luzerne County held monthly examinations of applicants for miners' certificates at the courthouse on Mar. 8-9 and questioned over 100 applicants of various nationalities who sought the right to mine coal. Seventy certificates were granted and the others were rejected on failure to answer questions satisfactorily. The examination

boards are making no distinction as to nationality, natives of Austria being accepted if their appearance and answers are satisfactory. At first when natives of Austria were classed as alien enemies the boards requested a decision from the court whether to grant these men certificates and were told to use their own judgment. Men are needed in the mines, and a man who is eager to work and aid this country in the production of coal is not considered an enemy.

Both the increase in anthracite output and fewer fatalities are shown in report, issued recently, by mine inspectors for the third, fifth, sixth and seventh anthracite districts in Lackawanna County, Pennsylvania, which produced 13,532,786 tons of coal, a big increase over 1916 despite the fewer number of mine-workers.

There were 85 fatal accidents in these four districts, or one fatality for every 159,186 tons produced. Of this number 72 occurred inside the mines and 13 outside. In the same districts there were 211 non-fatal accidents, the fatalities being saved by the safety devices installed in and about the mines by the operators at a constantly growing expense.

Inspector S. J. Phillips, of the fifth district, highly praised the work being done to safeguard mine workers at the Greenwood colliery of the Hudson Coal Co. An organization, known as the Safety Institute has been perfected, and numbers all of this colliery's employees. The operators are at work organizing all their working forces and will shortly issue a new set of safety rules for the benefit of all mine workers in the anthracite region.

Inspector T. J. Williams, of the eleventh anthracite district, in his 1917 report shows that there were mined 3,559,980 tons of coal by the eight collieries under his jurisdiction with 33 fatal accidents distributed among the 19 mines, and of these only one was gaseous. There were 10,000 tons of coal produced by electrical machines. The fatalities were 23 inside the mines and 5 outside. In his district there were 127,141 tons of anthracite produced per fatal accident.

PENNSYLVANIA

Anthracite

Lavelle—To provide for a large reservoir to be used for washing coal at its new colliery, the Laurel Hill Coal Co. purchased the George W. Turner farm. This farm of 149 acres contains large springs, streams from which will be turned into a big dam. Lack of adequate water-supply necessitated the purchase of the farm.

Hazleton—Members of the educational committee of Hazleton Mining Institute have decided to award diplomas to students completing the course of study in the night schools of the institute. State Mine Inspector John J. Stickler was elected head of the educational committee to fill a vacancy caused by the departure of Arthur H. Lewis to Wilkes-Barre.

The Pennsylvania R.R. closed a deal for the purchase of the coal yards of Claude L. Wilde, within a square of its freight station, for extensive enlargement of its facilities here as soon as the war is over. The consideration was \$35,000.

The Lehigh & Wilkes-Barre Coal Co. is making efforts to get control of the long abandoned mines at Silver Brook which were formerly operated by J. S. Wentz & Co. The workings are flooded but are said to still contain great quantities of anthracite, estimated by some experts at 3,000,000 tons.

Shamokin—Justices of the peace throughout Northumberland County report a 75 per cent. falling off in criminal cases in connection with their work. Full time at the collieries, strict observance of the coal corporations' rules against drunkenness and war conditions in general have had a wonderful effect on the morale of the coal region.

Mahanoy City—Special officers for the Susquehanna Collieries Co. have arrested 14 boys and young men charged with setting fire to a mountain of young trees owned by the coal company and upon which thousands of dollars in timbers had been destroyed. They were heavily fined.

Johnstown—The Hannan Coal Co., capitalized at \$10,000, is opening a new coal mine on the Horner and Wilson properties, in Ferndale, and expects to begin shipments within a few days. Dr. C. E. Hannan, of this city, is president; Henry Dabagh, of Pittsburgh, secretary-treasurer; R. C. Hannan, mining engineer, and F. F. Osborn, sales manager.

Bituminous

Dubois—The John E. Laing Coal Co. of this city, operating several mines at Weedville on the Buffalo & Susquehanna R.R.,

has sold its operations to James Archibald, of Weedville, Penn.

The Chief of the Department of Mines, Seward E. Button, has placed the Fourth Bituminous district under the jurisdiction of Inspector Joseph Knapper, of Philipsburg, of the Eighth District, until a successor to the late Elias Phillips is appointed.

The Stewart Coal Co., of Knoxdale, Penn., has taken over upward of 1000 acres of Redstone coal lands in Lewis County, West Virginia, about one mile from Weston, the county seat, a town of about 5000 population. The siding and tipples are built and coal is being shipped. Contemplated extensions to the existing plant will cost about \$50,000. Power will be furnished by the Monongah Traction and Power Co., and the boilers now in use will be done away with. A. L. Bouton, former city engineer of Dubois, will superintend the plant.

Punxsutawney—John McKleavy & Co. have sold their mines at Florence, Penn., to a new company composed of Punxsutawney men. A new mine was recently opened in the upper seam of coal and is developed to a capacity of about 100 tons per day.

Savan—A pocket of 6-ft. coal has been opened up here by W. H. Bicknell, and the operator is loading the production over the tipples of his Big Two mine. It has caused considerable excitement as this vein was heretofore unknown.

Pittsburgh—More than 100 of the leading mining men of western Pennsylvania, members of the various district examining boards, met at the Seventh Avenue Hotel on Mar. 8. The dates set for the mine foremen and firebosses' examinations this year are Apr. 9, 10, 11 and 12. The following men were selected to act as a committee to draft questions, answers and other minor details: P. J. Walsh, Nicholas Evans, mine inspectors; R. H. Kay, James Porter, superintendents, the operators' board representatives; John McKillip, J. O. Van Riper, miners' representatives. The alternates chosen are John I. Pratt, mine inspector; Thomas Easton, superintendent, and John Walters, miner.

Macdonaldton—Extensive improvements will be made in the present equipment of the Brothers Valley Coal Co. The capacity of the present mines will be materially increased and a new shaft opening will be made on another part of the property. The new mine will be electrically operated, and is to be modern in every respect. H. B. Reed, of New York City, is president of the company and Charles M. Means, of Pittsburgh, is consulting engineer.

Uniontown—Referee J. G. Carroll has set Friday, Apr. 12, at 10 o'clock as the time for a hearing at which lien creditors of the J. V. Thompson estate may participate prior to the proposed sale of Greene County coal lands to the H. C. Frick Coke Co. The meeting will be held in Mr. Carroll's office in the Cooper-Lackey building.

A deed recorded here last week shows the transfer of 130 acres of coal land in Franklin and Perry townships, Fayette County, from Ferdinand Guth to the Coke City Coal Co., of Connellsville. The consideration is given as \$11,000.

Brownsville—J. H. Price, of South Brownsville, has purchased the mine of the Ross Coal Co. near Merrittstown, and will operate it in the future under the name of the Price Coal Co. The new owner purchased the coal, the mining rights and the new coal tipples recently erected. Mr. Price will fill the contracts made by the old company.

Greensburg—The Westmoreland Coal Co. has sold to the Irwin Gas Coal Co. seven seams of coal in Franklin Township for \$237,001.80.

Pottsville—The Laurel Coal Co., composed of capitalists from Wilkes-Barre, are building a large breaker at Mowry.

Connellsville—The Jim Run Coal Co. has closed a deal for 163 acres of coal land in Stewart township, Fayette County, from Charles P. Newell and others for a consideration of \$30,000. A. C. Stiekel is president of the Jim Run Company.

West Virginia

CHARLESTON

Increases in several of the districts of the state having been granted by the fuel administration, operators at the central counties and northern counties, most of whom are affiliated with the Central West Virginia Coal Operators Association, have been requested to take their cost sheets to Washington in order that the application

for an increase in price for the coal from the mines in the Fairmont-Clarksburg field may be considered. The Central Association has named a committee to go to Washington. Figures forwarded to Washington show that production in the central West Virginia coal fields fell off more than 1,285,000 tons in the five weeks from Jan. 13 to Feb. 16, most of the decrease resulting from car shortage.

Coal operators on the Monongahela R.R. and on the Morgantown & Wheeling R.R. are facing a serious crisis, according to their opinion, unless an agreement can be reached at a meeting of committees representing the coal operators and Government railroad officials to be held in Washington at an early date. Officials of both the New York Central lines and the Pennsylvania System who jointly operate the Monongahela, it is alleged by the operators, have openly declared themselves opposed to supplying cars to the mines on the two railroads already referred to. If the sources of car supply—the Pennsylvania and the New York Central—are cut off every mine in the vicinity of Morgantown will be closed. The coal operators are to be represented by E. H. Gilbert, of Preston County, and Samuel D. Brady, for Monongalia, at the coming conference with Government railroad officials.

No cars are owned either by the Monongahela R.R. or the Morgantown & Wheeling R.R., and consequently those two roads are dependent upon the two systems which control them for a supply of cars.

While the movement of coal freight has materially improved in this state in the last three weeks, operators still voice the opinion that the tonnage moved is far below both the producing capacity of West Virginia mines and market demands. Consequently West Virginia mines, even with a return to conditions somewhat approaching normal, are not producing their maximum output.

In coal-mining circles it is felt that the fact that the fuel administration is seeking the cooperation of recognized experts in the mining industry will enable the administration to remedy existing conditions and will have beneficial results.

Cleveland capitalists and Virginian Ry. officials were in conference in Wyoming County last week with a view to determining the feasibility of building a branch line of the Virginian to tap the property of the Wyoming Pocahontas Coal Co. To reach the large tract owned by the Wyoming company it would be necessary to build about 10 miles of railroad, involving heavy construction work and the boring of a tunnel nearly a half mile in length. The branch, if built, would connect with the main line of the Virginian at Maben.

The Lick Fork Coal Co., located about 2 miles from Bishop on the Virginian Ry., will begin to load coal by Mar. 15. This colliery was recently purchased by P. C. Thomas, Alexander McNabb and F. S. Monahan, the latter having been placed in charge of operation. The company is said to have a 7½ ft. seam of clean coal. Up-to-date mining machinery has been installed.

The Hillcrest Coal Co. is opening a wagon mine just outside of Charleston at the eastern edge of the city. The development will be made in the Lewisburg seam. T. M. Boogs, of Charleston, is at the head of the enterprise.

The Davis Creek Coal and Land Co., which is headed by J. H. Snyder, of Charleston, has secured its right of way and is now shipping coal from its new mine back of Spring Hill.

Williamson—The Coalburg Coal Co., of Wilsondale, of which Judge F. H. Evans is president, has recently opened a fine plant on its property and is now ready to ship coal.

Clarksburg—According to a deed filed for record in the office of the county clerk, the Pitcairn Coal Co. has sold to the Harry B. Coal and Coke Co. the Pittsburgh vein of coal underlying 443 acres of land and three tracts of land in fee simple aggregating 164.57 acres in Clark district. The consideration was \$200,000.

Pike—Work of sinking the new slope for a coal mine on the property of the Cleveland Coal and Dock Co., at Roney's Point, is rapidly nearing an end.

ALABAMA

Birmingham—According to a statement of W. E. Matthews, president of the state board of convict inspectors, convicts employed in the mines of the Sloss-Sheffield Steel and Iron Co., Bessemer Coal, Iron and Land Co. and Montevallo Mining Co. earned more than \$50,000 during 1917 for coal mined in excess of their tasks. At Aldrich, an operation of the Montevallo

Mining Co., the convicts produced 20,691 tons extra and thus contributed their "bit" toward relieving the acute shortage of domestic coal.

Construction work has been begun on the new steel and concrete coal washery and screening plant of the Republic Iron and Steel Co., at Sayreton, near North Birmingham, Ala., and will be pushed to completion as rapidly as possible.

INDIANA

Vincennes—The Royal Coal Mines, backed largely by Vincennes capital, has obtained the option on 15,000 acres of coal land in Gibson and Pike Counties. The company is headed by Henry F. Allen, a coal operator formerly of Evansville. Marlein R. Moser is vice president; Charles A. Bainum, president of the Knox Bank and Trust Co., treasurer; W. M. Wilmore, general manager of the Hartman Manufacturing Co., and John L. Klemeyer, president of the Knox County Lumber Co., are trustees. One shaft is being sunk at Oakland City.

Sullivan—Henry A. Butler, of Cass, near this city, after 30 years in the coal business, has sold his interests in the Syndicate Coal Co. operating in Sullivan County, to Roy Price and John McLin, of Dugger.

ILLINOIS

Springfield—Examinations which were to have been conducted in Saline and Williamson Counties by the State Mining Board have been postponed as a result of epidemics of smallpox. The two counties were omitted from the itinerary of the board on recommendation of Dr. St. Clair Drake, of the state department of health. The board at this time is holding sessions in the southern part of the state.

Deciding that a train of the Alton & Chicago R.R. operated between Springfield and the Devereux mine is a "special" and not engaged in regular service, Commissioner Dempsey, of the State Public Utilities Commission, has overruled a petition of miners employed at the Peabody mine asking for an order to have this train stopped daily for their accommodation. The train is run under contract with the Devereux Co. The Peabody miners explained the train passed within a short distance of their shaft where 200 men were waiting to ride, but that the crew refused to stop. Company officials declared the seating capacity of the train now is taxed to the limit and that to overload the cars would tend to make travel dangerous. Lack of equipment precludes making up another train or of adding any cars to the one now in operation.

Subdistricts will be reorganized by the Illinois miners' union. A few years ago there were subdistricts in the state, but the plan has since been abandoned. Each subdistrict will contain about 15,000 miners and will have a president, secretary and other officers. The committee in charge of the reorganization is composed of George L. Mercer, Peoria; Hugh Watles, Herrin; Edward Dobbins, Belleville; Benjamin First, Gillespie; and William Hutton, of DuQuoin.

Bush—The new mine here recently opened by the Western Coal and Mining Co. is being rapidly developed for the production of fuel coal for the Missouri Pacific R.R.

Belleville—A coal miner from Shiloh recently bought \$1000 worth of Thrift Stamps during a Four Minute Man Campaign here. Another coal miner bought \$166.50 worth.

O'Fallon—On Mar. 7 three loaded coal cars pulled by a switch engine on a branch of the Baltimore & Ohio feeding the International Coal Co.'s Taylor mine went through a 75 ft. bridge, injuring two brakemen. The accident will tie up the Taylor mine two or three weeks, meaning a layoff of about 325 men.

Danville—The mine at Batestown has been sold by John Mauck to Terre Haute parties.

Carlinville—The Chicago & Alton Railroad Co. has given the name "Cowan" to the new station established 2 miles north of this city where the Standard Oil Co. is developing new mines. The station was named in honor of an official of the Standard Oil Co. who is in charge of construction work. Cowan will become an important coal-shipping station when the mines are opened.

New Baden—The New Baden mine of the Southern Coal, Coke and Colliery Co. has been opened, having been closed since Nov. 21, 1917, when a cave-in stopped all operation. The opening of the mine was a peculiarly difficult task as the mine caved in repeatedly and the work had to be done over patiently. Finally, 12 x 12-in. oak beams were used and a permanent shaft was opened. The mine will employ 650 men.

Ziegler—The Bell-Zoller colliery at Ziegler has been reopened. It has been closed since last December, when three miners died from a gas explosion. Inspectors sealed the mine after the explosion in hopes of getting control of a fire which raged for several weeks in the mine. Director Evan John, of the Illinois Department of Mines and Minerals, and State Mine Inspector Thompson approved the opening of the mine. They have not, however, authorized the opening of the New North mine at Christopher, Ill., where 18 miners were killed several months ago. There was also considerable property damage which must be repaired before the mine is opened. The shaft has been sealed for some time.

OHIO

Coalton—A large amount of development work in this section is projected and much of it is being carried forward at this time. When the new mines that have been planned are completed the output will be increased fully 25 per cent. if not more. Thompson & Son, of Radcliff, are opening a drift mine in No. 4 seam on the Hocking Valley Ry. near Radcliff. The company controls a large acreage at that place. It will be electrically equipped.

The Kinwood Coal Co. of Columbus, has started work on a drift mine located near Oreton in No. 4 vein. This is also located on the Hocking Valley Railway.

The Shafer Coal Co., of Logan, is another of the concerns to start work on a slope mine in No. 4 seam in Vinton County. J. J. Reitemeyer is superintendent.

The Wellston Rich Run Coal Co., of Wellston, is opening a shaft mine in No. 2 seam which is designated for gas coal. A hoist is to be built.

The Standard Colliery Co., Jackson, of which E. L. Stephenson is superintendent, is opening a mine in No. 2 seam in the Jackson district. It will be exclusively pick mining.

St. Clairsville—The coal company recently formed by Oliver Monaco, Louis Costanzo and other residents of this vicinity will mine the coal owned by ex-Congressman W. B. Francis at Robyville, near Adena, on the local branch of the W. & L. E. The company's tipples is half completed. The plant will cost \$60,000. The company is one of the few that will mine on a royalty basis.

Steubenville—It is reported that the City of Cleveland is seeking coal lands in Jefferson and Belmont Counties. It is expected that about \$3,000,000 will be expended on coal properties. The Cleveland administration plans to purchase large coal tracts and to erect a large power plant. S. A. Williams, representing the Cleveland administration, is in this vicinity, looking over available property.

KENTUCKY

Lexington—The Frick interests recently announced a program for the expenditure of \$9,000,000 in the development of 30,000 acres of coal land for the Louisville & Nashville R.R. A modern Kentucky town is to be built in South Harlan County, giving employment to thousands.

Whitesburg—Ohio people, including M. C. Justice, W. K. Elliott and others, have organized the Eastern Kentucky Coal and Land Co. in Pike County, with \$100,000 capital, after acquiring 800 acres of coal lands for development. Work is to be started at once.

Madisonville—The power house of the Shamrock Coal Co., near Providence, owned by the St. Bernard Coal Co., of Earlington, was dynamited recently and the concrete building practically ruined.

COLORADO

Denver—Twelve mines in the bituminous coal fields in Colorado, having a total production of 2500 tons daily, ceased operations to-day as a result of the fuel administration's order reducing the price of coal, according to reports made to the Colorado division of the fuel administration. As many more mines, reports received by the State Administrator said, will shut down Apr. 1. More than 500 miners are idle and the number may reach 1000 within a week, it was reported. A 50c. reduction in the price of Colorado coal at the mines went into effect on Mar. 11 and a further cut of 70c. has been ordered, effective Apr. 1.

Foreign News

Edmonton, Alta., Can.—A railway line to tap the immense anthracite coal fields held by Patrick Burns, a packing magnate of Calgary, in the foothills of the Rocky

Mountains southwest of Calgary, has been made possible by a bill passed in the house to incorporate the Calgary & Southwestern Ry. It is reported that this line will be started at once in order to bring the coal into the Calgary market next winter, if possible.

Montreal, Can.—Profits of the International Coal Co. for the year ending Dec. 31 last totaled \$183,419 compared with \$122,734, an increase of \$60,685, or 49.4 per cent. Deductions amounted to \$83,427, leaving a surplus for the year of \$99,992, which, added to the previous surplus, made the profit and loss total \$179,089. Charles Fernie, the president, stated that the total quantity of coal raised was 170,700 tons, compared with 143,748 in 1916, an increase of 35,952 tons. Outputs were at times, however, adversely affected owing to shortage of labor. Current assets totalled \$301,868, compared with current liabilities of \$42,098, leaving the net working capital \$259,770, compared with \$164,307 a year ago.

Personals

Harry Irvine has been appointed manager of the Carter Coal Co., Charleston, W. Va.

Frank B. Stewart, of Cincinnati, Ohio, for some time treasurer and general manager of the Winifrede Coal Co., operating in Kanawha County, has been made president of that company.

Irene Stahl, formerly private secretary to A. W. Calloway, president of the Davis Coal and Coke Co., has been promoted to assistant secretary of the Davis Coal and Coke Co. and allied interests.

J. E. North resigned as mine foreman of Fulton Run shaft of the Jefferson and Clearfield Coal and Iron Co. to accept a similar position with the Allegheny River Mining Co. at Pine Furnace, Penn.

George Love, formerly mine foreman for the Jefferson and Clearfield Coal and Iron Co. at Ernest, Penn., has accepted a similar position with the Cowanshannock Coal and Coke Co. at Yatesboro, Penn.

J. E. Sullivan, of Jermyn, Penn., and for the past 10 years a special agent for the Pennsylvania Coal Co., has been made chief clerk to E. J. Mulvihill, assistant to the president. Mr. Sullivan will have headquarters at the main offices in Dunmore, and will be in direct charge of about 50 clerks.

Obituary

Capt. James Miller Hustead, aged 91, one of western Pennsylvania's biggest coal and coke operators, died at Clearwater, Fla., recently.

David Murphy, of Dawson, N. M., a member of the New Mexico mine inspection crew, was killed on Mar. 6 in the Government coal mine at Carthage, N. M., when he removed his oxygen helmet while making an inspection of the mine with four other members of the crew, according to State Inspector Risbon. He was carried to the mouth of the mine where effort to revive him proved unsuccessful.

Publications Received

Twenty-sixth Annual Report of the Ontario Bureau of Mines, 1917. Vol. XXVI. Printed by order of the Legislative Assembly of Ontario. Illustrated, 6½ x 9½ in.

"The Determination of Moisture in Coke." By A. C. Fieldner and W. A. Selvig. Department of the Interior, Bureau of Mines. Technical paper 148. Unillustrated, 12 pp., 6 x 9 in.

Combustion of Coal and Design of Furnaces. By Henry Kreisinger, C. E. Augustine and F. K. Ovitiz. Department of the Interior, Bureau of Mines. Bulletin 135. Illustrated, 137 pp., 6 x 9 in.

Combustion of Coal and Design of Furnaces. By Henry Kreisinger, C. E. Augustine and F. K. Ovitiz. Department of the Interior, Bureau of Mines. Bulletin 135. Illustrated, 137 pp., 6 x 9 in.

Occupational Hazards at Blast-Furnace Plants and Accident Prevention. Based on Records of Accidents at Blast Furnaces in Pennsylvania in 1915. By Frederick H. Willcox. Department of the Interior,

Bureau of Mines. Bulletin 140. Illustrated. 147 pp., 6 x 9 in.

Coal: The Resource and Its Full Utilization. By Chester G. Gilbert and Joseph E. Pogue, of the Division of Mineral Technology, United States National Museum, Smithsonian Institution, United States National Museum. Bulletin 102, Part 4. Unillustrated, 26 pp., 6 1/2 x 9 3/4 in.

Catalogs Received

Graphite Mine Car Lubricants. United States Graphite Co., Saginaw, Mich. Booklet. Pp. 16; 3 1/2 x 6 in.; illustrated.

"What the Erie Is Doing" is the title of a new bulletin issued by the Ball Engine Co., Erie, Penn., which shows how the Erie steam shovel is employed on various kinds of work.

Anniversary Advertising Portfolio of 85% Magnesia. Magnesia Association of America, 702 Bulletin Building, Philadelphia, Penn. Illustrated, 32 pp., 10 1/2 x 13 1/2 in. The book is a large and impressive assemblage of all the educational publicity regarding the association's insulation which has been appearing in the technical press. It is a series of careful presentations of the nature and applications of 85% Magnesia for covering steam pipes and boilers.

Safety Auto-lock Switches. Krantz Mfg. Co., Inc., of Brooklyn, N. Y. Special publication No. 1585-A. These switches are designed for use on circuits wherever the ordinary knife switch may be applied. They are especially designed for safety, it being absolutely impossible to touch the live parts regardless of the position of the switch or of the door. Switches are particularly adapted for use in steel mills, factories, mines and other similar locations where men are employed who have no practical knowledge of electricity.

Recent Coal and Coke Patents

Gas Producer. H. J. Green, Bolton, Eng., 1,252,000. Jan. 1, 1918. Filed July 26, 1915. Serial No. 41,929.

Coal Hole Cover. J. Frank, New York, N. Y., 1,252,795. Jan. 8, 1918. Filed July 21, 1916. Serial No. 110,583.

Coke Oven. J. E. Hubbell, Philadelphia, Penn., 1,254,007. Jan. 15, 1918. Filed June 14, 1917. Serial No. 174,720.

Coal Handling Jig Gate. M. H. Reap, Scranton, Penn., 1,252,947. Jan. 8, 1918. Filed May 10, 1917. Serial No. 167,696.

Coal Drill Socket Retaining Apparatus. J. C. Moler, Mulberry, Kan., 1,253,511. Jan. 15, 1918. Filed Dec. 7, 1916. Serial No. 135,605.

Steam Boiler. D. S. Jacobus, assignor to Babcock & Wilcox Co., Bayonne, N. J., 1,252,444. Jan. 8, 1918. Filed Apr. 7, 1917. Serial No. 160,369.

Unloading Apparatus for Bottom Dump Cars. O. G. Petersen, Somerset, Ky., 1,252,717. Jan. 8, 1918. Filed July 12, 1916. Serial No. 108,934.

Ash Conveyor. T. K. Webster, assignor to American Steam Conveyor Corporation, Chicago, Ill., 1,252,522. Jan. 8, 1918. Filed Aug. 28, 1916. Serial No. 117,200.

Mine Car Wheel and Axle. F. H. Gibbs, assignor to American Car and Foundry Co., New York, 1,256,484. Feb. 12, 1918. Filed Nov. 22, 1916. Serial No. 132,827.

Coal Feeder for Gas Producers. W. J. Lindsey, assignor to Camden Iron Works, Camden, N. J., 1,256,340. Feb. 12, 1918. Filed May 26, 1916. Serial No. 100,058.

Mine Car Wheel with Hub Cap. W. V. Johnson, assignor to American Car and Foundry Co., New York, 1,256,137. Feb. 12, 1918. Filed Sept. 22, 1917. Serial No. 192,393.

Hopper Car Door Operating Mechanism. J. E. Rohlfing, assignor to American Car and Foundry Co., New York, 1,256,165. Feb. 12, 1918. Filed Apr. 10, 1917. Serial No. 160,952.

Industrial News

Philadelphia, Penn.—The Jonathan Coal Mining Co. has been incorporated with a capital of \$100,000. The incorporators are F. E. Hansell, of Philadelphia, J. Vernon Pimm and S. C. Seymour, of Camden, N. J.

Findlay, Ohio—The Virginia Fuel Co. has been incorporated with a capital of

\$10,000 to deal in fuel. The incorporators are A. E. Kerns, Chester Pendleton, George W. Corbin, T. C. Schwartzbeck, Gladys E. Yoxthimer.

Buffalo, N. Y.—The Border Coal Co. has been incorporated with a capital of \$10,000 to engage in the coal and wood business. The incorporators are B. M. Lempenau, M. L. Heinis of Buffalo, and M. C. Bartholomew, of West Falls.

Philadelphia, Penn.—Nearly 99 1/2 per cent. of the coal coming into this city is clean coal, says the Pennsylvania Fuel Administration, according to a statement issued recently by the General Committee of Anthracite Operators.

San Diego, Calif.—Material for the construction of a concrete coaling platform at the naval coaling depot at La Playa is being assembled. The platform will replace the present wooden decking on which coal is stored. It will be built by day labor.

St. Clairsville, Ohio—The Century Coal Co. has been incorporated with a capital of \$60,000. The incorporators are John C. Nichols, David H. Thomas, John H. Anderson, Thomas J. McNamee, Bert W. Hopkins, J. H. Boroff, S. E. Boroff and J. A. Williamson.

Muskogee, Okla.—Headquarters for District 21, United Mine Workers of America, which includes the states of Texas, Arkansas and Oklahoma, was moved on Feb. 28 from McAlester, Okla., to Muskogee. The office had been maintained at McAlester since the organization of the district in 1908.

Bayonne, N. J.—A large portion of the trestle of the Lehigh & Wilkes-Barre Coal Co., at the Port Johnson docks here, was destroyed Sunday of this week. Shipments will be taken care of at the Elizabeth docks. It is believed that a couple of months will be required to rebuild the trestle.

Washington, D. C.—All shipments of coal from the Pocahontas district of West Virginia except that for byproduct use were ordered shipped to tidewater points for bunker and other purposes by the fuel administration on Mar. 10. The orders included all coal standing on mine sidings and continued in effect until the night of Mar. 12.

St. Louis, Mo.—Wood-chopping "bees" marking the inauguration of a movement to conserve coal have been started in St. Louis County. Parties are formed under the guidance of experienced wood choppers and the cords are stored away for next winter's supply. Many districts have pledged themselves to use no more coal until the end of the war.

Denver, Colo.—The Colorado Fuel and Iron Co. reports for the six months ended Dec. 31, 1917, a surplus of \$1,647,117 after all expenses and charges have been deducted. Dividends paid on the preferred stock totaled \$8000 and on the common stock \$513,438, leaving a balance of \$1,053,679 carried to the profit and loss account. Profit and loss surplus, as of Dec. 31, 1917, was \$7,689,875.

Cincinnati, Ohio—Plans have been completed for a conference in Cincinnati on Mar. 20 of representatives of Ohio Valley cities interested in the improvement of the river for transportation purposes, the Ohio Valley Improvement Association having the matter in charge. Specific plans for improvements in the way of terminal facilities and connections with railroads will be discussed.

St. Louis, Mo.—The Walter A. Zelnicker Supply Co. has recently secured the services of G. W. Bichmeir, who prior to his association with the Zelnicker company was connected with the supply departments of the Missouri Pacific and Kansas City Southern Railway companies, as well as having been secretary-treasurer of the W. L. Sullivan Machinery Co. Mr. Bichmeir is connected with the Zelnicker machinery department.

Tacoma, Wash.—Suit for the foreclosure of the property of the American Coal Co.'s mines and improvements near here has been filed in the Superior Court by W. V. Rinehart, Jr., trustee for the Seattle Trust Co. Bonds of the company amounting to \$1,500,000 were indorsed by the Seattle Trust Co. Interest since Mar. 1, 1912, when the mortgage was executed has not been paid and amounts to approximately \$500,000 more.

Columbus, Ohio—On behalf of a delegation of coal miners from Guernsey County, Governor James M. Cox took steps to see that the district is furnished railway cars on the basis desired by the delegation. The miners say that there are two months in the year, in the spring, when the mines are

flooded and they cannot work, and that they wish their cars so distributed as to time that they may get 100 per cent. car supply in times when they can work.

St. Louis, Mo.—Information has been received here that Attorney-General McAllister is preparing to file suits under the anti-trust law against members of the Fifth and Ninth Illinois Districts Association and the Fifth and Ninth Districts Coal Bureau, based on information obtained by him in an inquiry last November and December. McAllister, when questioned, said that he would not act hastily and that he was not prepared to say what his ultimate plan of procedure would be.

Columbus, Ohio.—The announcement is made by Secretary B. F. Nigh, of the Michigan-Ohio-Indiana Coal Association, that the annual convention of the organization will be held in Cincinnati, the exact time to be fixed later. It is believed that the date will be the last week in April. Last year because of unusual war conditions the annual meeting was called off. This year the meeting will be of a strictly business nature and practically all entertainment features will be eliminated.

Springfield, Ill.—A suit has been filed against the Chicago-Williamsburg Coal Co. restraining it and its officials from disposing of its "company stock," requiring the company to display its records and asking that a receiver be appointed for the company. E. H. Buckley filed the suit, alleging that he paid certain debts of the company with agreements that he was to receive 768 shares of stock. He also asks that the stock due him be ordered delivered by the company on order of the court.

Washington, D. C.—Government reports give details of an important addition to the world's coal supply. The new source of supply is guaranteed by the building of a new Peruvian railroad which will run to the eastern slope of the Andes. The coal fields, which are 25,000 ft. above sea level, are estimated to contain about 50,000,000 tons. The coal is said to be of excellent quality. The new railroad will cost about \$1,500,000 and will be financed by the Italian bank at Lima. The contract is not let, but the grading probably will start within the next three or four months.

St. Louis, Mo.—Edward F. Goltra, president of the Mississippi Valley Iron Co., who is planning a barge line to the northern fields for shipments of coal and iron ore, has entered a denial to charges of Congressman James A. Frear, of Wisconsin, that he received anything "free" from the Government in the experimental barge trips made under his supervision. Two Government boats, used in making the experiments, Goltra said, were paid for in full. The barge line, which now is nearing reality, is designed to transport iron ore from the northwest ranges to St. Louis and to ship coal from the southern Illinois fields for return cargoes.

Wheeling, W. Va.—The annual meeting of the Ohio Coal Strippers' Association was held in Wheeling on Mar. 7, the principal pieces of business transacted being the admission of West Virginia and Pennsylvania stripping operators, and the change of the name of the organization to the Tristate Strippers' Association. The following officers were elected: President, W. J. Sampson, Youngstown, Ohio; vice president, George A. Blackford, Wheeling, W. Va.; secretary, B. A. Elkins, Cleveland; treasurer, Douglas Vaas, Wheeling; directors, the officers and Everett Ferguson, Steubenville, Ohio; J. A. Swanberg, Danville, Ill., and E. A. P. Roy, Cleveland. The organization now has a membership of 35 operators, representing an investment of \$60,000,000. Resolutions were adopted pledging full support to the Government in the conduct of the war. A meeting will be held in Pittsburgh on Apr. 7.

St. Louis, Mo.—A protest has begun to take form against the plan to supply St. Louis and the eastern district of Missouri from the Fifth and Ninth Illinois districts, to the exclusion of the normal supply of high grade coal from Franklin and Williamson Counties, which it is intended to divert to Chicago. While the plan would assure St. Louis of a supply of fuel, it would be practically all of the inferior grade which comes from the Fifth and Ninth districts. There is a disposition on the part of consumers to insist that part of the high grade coal from southern Illinois be sent to St. Louis, particularly as St. Louis is nearer to the southern Illinois field than Chicago and shipments from that field to Chicago will have to go around St. Louis. P. H. Greenlaw, Secretary of the Fifth and Ninth Districts Bureau, has been recommended by operators of those districts as Government Distributor for St. Louis and the Eastern district of Missouri.

MARKET DEPARTMENT

Weekly Review

Coal Year Drawing to a Close—Improvement in Output of Bituminous Due to Better Car Supply—Anthracite Still Short—No Contracting as Yet

THE most eventful year in the history of the coal industry is drawing to a close. Operators, jobbers, dealers and the consuming public are relaxing from the tension of a nerve-racking winter and turning hopefully toward Washington, whence is soon to come the word that will dispel the clouds of uncertainty that now envelop the Government's plans for prices, zoning, car supply, diversion of shipments and so forth.

The demand for coal continues to exceed the supply in virtually all grades. A slight improvement is evident in the production of bituminous coal—an improvement which can be traced directly to a better supply of cars at the mines. In this connection it is interesting to note that the effects of the Government's decision to buy increased motive power for the coal-carrying roads are already being felt. A large number of locomotives that were being built for the Russian government were purchased for use on the various roads in the Pennsylvania coal-mining region,

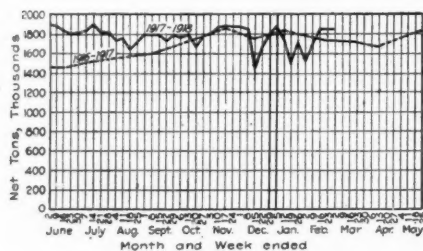
and many of them are now in service. It can safely be asserted that with this increase in motive power and a better supply of cars the bituminous mines will soon be producing enough soft coal to meet the country's needs.

As regards anthracite coal, however, the situation is not so favorable. The production of hard coal has about reached its zenith, and it is doubtful if the 77,000,000 tons mined in 1917 will be approximated this year, much less bettered. It has been figured out that the total population of the anthracite-burning area, which includes New England, the Middle Atlantic states and the District of Columbia, is 32,877,609. Therefore, if only 25,000,000 of this total be taken as a basis, it would mean that there would be three tons to every consumer. When it is also considered that this does not include the Government's coal supply, nor the constantly increasing number of war industries that use hard coal, it can be understood readily why anthracite will continue to be scarce for some time.

Indications point to a heavy contract demand after Apr. 1, which is the beginning of a new year in the coal trade. Consumers have still uppermost in their minds the memory of the past winter's sufferings, and they are determined not to fall short again if they can help it. The trade is fixing no prices in contracts, however, the general attitude being that as the Government's prices must necessarily prevail, subject to such future action as the Fuel Administration may see fit to take in the matter of distribution, there is nothing to be gained by a fixing of contract prices. Agreements are being made which simply state that a certain number of tons of a certain kind of coal will be furnished, subject to existing and future Government regulations, and to whatever other contingencies may arise to affect either the price or the supply. The fact that consumers are readily accepting contracts under such extremely indefinite conditions is an indication of the anxiety to secure a fuel supply.

COAL PRODUCTION

Except for time lost in occasional observances of Washington's Birthday as a holiday, the continued fair weather has permitted three consecutive weeks of normal operation with bituminous production well above 1,800,000 tons per day. Preliminary estimates place the output (including lignite and coal made into coke) at 11,055,000 tons during the week ended Mar. 2. The average production per working day was 1,843,000 tons, as compared with an average of 1,777,000 tons for the past year and 1,753,000 tons in February, 1917. The total production of beehive coke is esti-



mated on the basis of railroad shipments at 621,000 net tons, an average per working day of 104,000 tons. The output was the largest recorded since early in December and reflects the improved car supply at the ovens. Anthracite shipments amounted to 39,875 cars.

Steady improvement in operating conditions at byproduct coke plants was reported during the week of Mar. 2. For all plants reporting the ratio of tonnage produced to maximum capacity rose from 77 to 79.9 per cent. The improvement was effected by a reduction in loss due to lack of coal, the tonnage lost for that cause amounted to 14.4 per cent. of maximum capacity. Only one plant reported labor

trouble, and its loss on that account was small. Alabama and New Jersey were the only states in which production declined appreciably. An increase in losses due to no coal caused the ratio of tonnage produced to full-time capacity in the former state to drop from 84.3 to 74.4 per cent. Conditions in Massachusetts and Minnesota underwent no change. In all other states, particularly in the Middle West, operating conditions improved. Illinois, which had suffered severely from shortage of byproduct coke reported a production of 84.2 per cent. of capacity. The output in Indiana though still restricted by inadequate transportation, continued to increase. Production in Maryland was 97.8 per cent. of capacity.

TABLE II. CARLOADS OF COAL AND COKE ORIGINATING ON PRINCIPAL COAL-CARRYING ROADS

	Week Ended:				
	Feb. 9	Feb. 16	Feb. 23	Mar. 2	
Bituminous shipments, 121 roads..	181,586	189,984	189,691*	196,563†	
Anthracite shipments, 9 roads...	32,011	40,661	36,612*	39,875†	
Beehive coke shipments, 4 roads...	10,470	11,357	11,634*	12,753†	

* Revised from last report. † Subject to revision.

Atlantic Seaboard

BOSTON

Somewhat less anxiety over current needs. Most of local restrictions removed Mar. 6, and normal hours resumed. Much eagerness to know season program, although no adequate plan has yet been put forth. Washington interested in New England coal statistics. Meanwhile a large tonnage of "Storrow coal" diverted to keep railroads in operation. Army colliers slow in arriving. Textile manufacturers hold

conference to support jobbers as performing a necessary function. Emergency supplies doled out to industrials, a few days' supply at a time. All-rail movement fair. Heavy weather again interferes with boats. Dispatch not so good at Hampton Roads. "Storrow" coal beginning to move also by barges from New York piers. Anthracite loading beginning to be less irregular.

Bituminous—The storm of Mar. 10 was a vigorous reminder that winter conditions have not entirely passed. Receipts again show a falling off and demands upon fuel authorities to keep plants running are as insistent as ever. The railroads are still worrying along on an extremely close-hauled basis, and hardly a collier reaches Mystic Wharf, Boston, without a portion of the cargo being requisitioned by the Boston & Maine. All the industrials, too, are working on small coal reserves, but all will admit less apprehension over the near future. Under present conditions distribution is bound to be uneven. The question whether a consumer gets deliveries in contracts depends upon whether his source of supply has a car supply over and above the various "priorities." The buyer who either has no contracts or is unable to get coal in the open market has to make himself heard by the Fuel Administration and there, if possible, he is given a supply, limited usually to a few days. The departments at Washington are still actively supporting the demands made by plants manufacturing Government material, and there is now a detail of officers with Mr. Storrow's office to recommend to the distributors an order of preference in which manufacturers should be served, the classification being roughly according to prior need of output.

Beginning Mar. 6 the regulations governing retail stores, office buildings, etc., the past six weeks were lifted, except for the Federal order requiring two lightless nights per week. The result is a heavier draft upon retail stocks of coal and to such extent that the dealers have been seriously

embarrassed more than once the past week. Efforts to make up the Boston deficiency all-rail are not productive, and it is evident that all distributors must to a greater extent exert themselves at Hampton Roads and elsewhere to get coal loaded. It is observed that large industrials, like paper mills, power plants, etc., are getting coal in somewhat increased volume, chiefly because they are using every means at their command to get barges and steamers to the piers to connect with coal arranged for the mines. In other words, those who try energetically to help themselves, as in the old days of competition, are likely this year to get better service.

No material change has so far been made in the all-rail order of Jan. 3, covering emergency shipments to the New England Fuel Administration. About 90 cars are now the daily yield instead of the 500 that are so often referred to, and of these about 80 per cent. are going to the railroads for engine supply. Only on one day, and that in January, did actual shipments amount to 60 per cent. on this order.

Only two of the "army colliers" sent here through the Quartermaster-General's office have so far reached Boston. The cargoes were distributed to textile and other plants engaged on war orders. The other ships have not loaded as yet, so the measure of relief to New England industrials through this channel is so far not very great.

Deliveries from emergency supplies at the disposal of the fuel authorities continue to be made on a hand-to-mouth basis, a week's supply usually being the most that a plant of any size can secure from any one cargo. Occasionally this is modified in cases where large consumers are in sections by themselves, as, for instance, the Great Northern Paper Co. at Millinocket, Maine, using more than 150,000 tons. A steamer is assigned for that particular plant and continues until some other arrangement has to be made.

All-rail movement keeps up in fair shape, although every few days there is more or less congestion. It is plain, however, that one or two of the gateways could handle more coal if it were sent to them. Increased shipments over the New York piers for Bridgeport, New Haven and New London are helping out the situation at Harlem River and therefore in the southeastern corner of Connecticut. There have been several cases where plants have actually shut down and there are many more where there would have been shutdowns if the New Haven R.R. had not come to the rescue from its engine supply.

Loading dispatch at Hampton Roads has slackened enough so that two or three days is the best that cargo ships can rely upon. Movement from the mines shows improvement the last few days and when dumping is more regular it is likely that coal will flow to the piers in better volume. Unfavorable weather has interfered with the arrival of boats and there have been days the past week when the public would have been alarmed had it been generally known how little coal was available for the absolutely necessary needs. Of one cargo of "Storow" coal this week, 17,500 tons in all, nearly half had to be turned over to the Boston & Maine R.R. to keep the Boston terminal in operation.

There is now a fairly steady volume of coal coming forward along the Sound for Mr. Storow's account, thereby relieving a great many emergency needs inland from Providence and other points. There seems a good supply of box barges for this trade, and in these days of locomotive shortage it should help a lot.

Anthracite.—Movement all-rail shows a very material improvement over corresponding days in February, although the number of cars passing the gateways increases only gradually from day to day. Aside from interruptions because of weather the loading of barges at Philadelphia and New York is less intermittent and a better volume of tidewater coal is now looked for. There are many rumors of new methods of distribution the coming season but they are hard to verify. Another week will doubtless see announcements of much importance.

NEW YORK

The announcement from Washington regarding reduction in prices is pleasing to the trade. Retailers arranging for proper distribution of coal. While demand is not so heavy coal remains scarce. Steam coal situation unchanged. Bituminous situation slightly improved due to better car supply. Miners want more work. No inclination on part of producers to make contracts.

Anthracite.—The announcement from Washington that mine prices for the domestic sizes will be reduced 30c. per ton

during the four months beginning Apr. 1 has gone a great way toward placing the anthracite situation on a firmer basis. Although the flat reduction came as a surprise to most coal men, the change from the old form of discount seems most welcome as everybody realizes the consumer will look upon it with more favor. It will also mean considerable in the way of business to the retail dealer.

Dealers are not waiting for the new prices to go into effect before placing orders for their summer coal. Demand, so far as the wholesale offices are concerned, continues strong, but mild weather conditions have caused a lessening in consumption which has resulted in a let-up on retail dealers and enabled them to put some coal into their yard bins. Dealers in The Bronx, according to the announcement of the Fuel Administration officials, on one day during the past week had more coal on hand than on any day since the early part of the winter.

Supplies at the docks are not heavy, although production is at top-notch. Middlemen dependent entirely upon free coals are not able to find many stray lots.

Cleaner coal is one of the matters of vital interest to the trade. Many complaints continue to be heard but tradesmen say the coal is coming forward in better shape. The operators have assured the public that they are outspoken for clean coal. Inspectors of the Fuel Administration are in the coal regions watching shipments and dirty coal is immediately returned to the shipper.

Harry T. Peters, chairman of the State Conservation Committee, has submitted to A. H. Wiggin, State Fuel Administrator, a report on the fuel needs of New York State and its coal supply for next winter. The report recommends that public service corporations, public utilities and hospitals should put in a sufficient supply of coal to take care of their normal winter needs, that county fuel administrators should investigate conditions in their respective localities and report to the state fuel administrator as to their storage facilities, and that plans should be made so as to facilitate and secure the proper distribution of the necessary quantities of coal.

There has been no change in the steam-coal situation. Buckwheat and rice are practically out of the spot coal market, while barley and culm are difficult to get. Nothing has been heard from Washington regarding the prospects of Government price fixing for these sizes. As the time approaches for the renewal or the making of new contracts for the small anthracite coals there is much conjecture as to what course operators and wholesale dealers will take.

Current quotations, per gross tons, f.o.b. Tidewater, at the lower ports are as follows:

	Circular	Individual
Broken.....	\$6.30	\$7.05
Egg.....	6.20	6.95
Stove.....	6.45	7.20
Chestnut.....	6.55	7.30
Pea.....	5.05	5.80
Buckwheat.....	4.30@5.00	5.50@5.80
Rice.....	3.75@3.95	4.50@4.80
Barley.....	3.25@3.50	4.00@4.25
Boiler.....	3.50@3.75

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous.—There has been an improvement in the bituminous situation at this harbor, but the demand is so heavy that supplies on hand at the docks do not show an increase. Everybody appears to want coal and as a result the buyer who wants in excess of his contract has a slim chance of picking up free coal.

Reports from the mines are more encouraging than for some time past. Car supply is better, the mines along the Pennsylvania receiving about 25 per cent. of their requirements, while the other roads are doing as well if not better.

Production continues to improve and the Fuel Administration officials are hopeful that the tonnage figures will show the amount necessary to meet the nation's needs.

Consumers without contracts are having a hand-to-mouth existence so far as coal is concerned. Contract coal is none too plentiful, and as practically all of the coal shipped is going on contract or priority orders there is very little left for the spot buyer.

Demand is heavy from all sections of the East, shippers here receiving many inquiries from New England, Canada and the northern part of the state.

It is not likely that many contracts will be closed between now and April 1, the

beginning of the coal year, although buyers are showing unusual activity in their efforts to protect themselves. Operators on the other hand are not displaying any great desire to tie up their output, but it is the belief that any consumer having a contract now will be taken care of in the matter of distribution after the expiration of his contract.

PHILADELPHIA

Anthracite spring prices create stir. Order silent on individual differential and broker's commission. Retail trade quiet. Larger dealers anxious to store at present prices. Gross retail margin unchanged. Interest as to contract prices. Bituminous conditions improve, but demand still extraordinary. Rail conditions improve. Increased motive power promised. No contract business.

Anthracite.—The feature of the week has been the announcement of the new spring prices by the National Fuel Administration. The plan of making a flat reduction of 30c. a ton on domestic sizes to remain effective from Apr. 1 to Sept. 1 seems to meet with the approval of most interests. According to this the prices beginning Apr. 1 will be as follows:

	Line	Tide		Line	Tide
Egg.....	\$4.50	\$5.70	Chestnut.	\$4.85	\$6.10
Stove.....	4.75	6.05	Pea.....	3.45	4.35

Unless a change shall be made by the Fuel Administration it will be seen from the new order that the winter prices for next year, beginning with Sept. 1, will be the same as have been in effect during the winter just passing.

For a week past there has been much confusion in the local market, as the state fuel administration had given out the information that the regular 50c. discount, with the 10c. decrease each month, was to be put into effect on Apr. 1. Evidently there was a mix-up somewhere, for the switch to a flat discount of 30c. came with a suddenness that startled.

Due to the publication in the local papers that a price reduction was imminent, together with the mild weather, the retail trade has been extremely quiescent. Probably no better illustration of this was the advertisement of a large local retailer announcing to his regular customers that he was in position to fill orders on all sizes for current consumption, giving the retail prices. This is the first publicity used by any retailer for many months. Business continues quite brisk on chestnut and pea, but many requests to hold the larger sizes are being received by the shippers, especially from dealers who supply the smaller homes.

While the retail business is somewhat inactive, or at least having lost much of its vigor of previous weeks, the stocks on hand continue to be quite small; but some of the large buyers, with more courage than their smaller competitors, are anxious to increase theirs. They claim that despite the announced reduction of 30c. beginning with Apr. 1 they will be willing to pocket this loss on any coal they store now, in order that they may be in position to do business as soon as the rush comes. The wiser ones realize they have nothing on which to base a belief that they will receive substantial shipments immediately after the first of the month. There are a few who admit that if the \$2.50 gross margin which they now enjoy is not disturbed they can easily afford to assume this 30c. if only to keep their equipment going. Another thing which inclines them to the belief that there will be no great rush of coal to this market, at least not in excess of last year, is the statement of several operating authorities that they believe the maximum production of anthracite coal has now been reached and that it will be many years, if ever, before the production of the past year will be approximated.

In regard to the margin of gross profit to be allowed the dealers after Apr. 1, nothing definite has been announced and the trade remains on the anxious bench, for it was intimated when the margin was increased it was only because of more difficult delivery conditions during the winter. Chairman Lewis has promised a decision in the matter before Apr. 1.

With the definite announcement of a reduction in prices throughout the summer the dealers began to receive quite a large number of orders, but the rush does not seem to be nearly so large as usual, on account of the reduction being equalized for the entire summer. For this reason some dealers fear that they will be swamped with orders during August, the last month of the cheap coal. However, the coal authorities intend to keep urging consumers

to order at once and in addition the dealers will more than likely solicit orders themselves with the understanding that delivery is to be made before Sept. 1.

Early in the week the records showed but 39,000 tons of coal in stock in the various retail yards. This is estimated as being only 3 per cent. of what the Fuel Administration hopes to see stored in the cellars before fall, by which time it wants to see 1,140,000 tons tucked away.

We learn that much time and thought is being given by the various shippers as to the distribution during the coming coal year. All figures are naturally based on purchases of the past two years. In the latest order issued by the National authorities this matter of anthracite distribution has been placed in the hands of two local men. W. J. Richards, president of the Philadelphia & Reading Coal and Iron Co., and S. D. Warriner, president of the Lehigh Coal and Navigation Co. In addition to J. B. Dickson, of New York. If the public at large is to carry out the desires of the authorities, the coming spring and summer will see more coal delivered to homes than during any similar season in the history of the trade.

While many of the local retailers, with the exception of the larger ones referred to, are inclined to hold orders at this time, this causes no concern with the operating companies, for they are making heavy shipments to the West, while New England also continues to receive attention. The movement to outside markets has been of such volume as to reduce receipts here to about 8000 tons daily.

The local authorities continue to wage the campaign against dirty coal and this week condemned several shipments that had been dumped in the yards of retailers. The local committee also has sent details of its system of inspection to the administrations in the other states receiving anthracite, which method has been approved by the National Fuel Administration.

With the new spring prices in effect much interest is taken in what the new contract prices on steam coals will be. While fewer contracts than usual were closed last year by all the companies, yet there are certain sizes, particularly rice and barley, that the companies are anxious to have assigned in this way. Of course, the steam prices are not controlled by the Government, but it has always been the practice to advance or decrease these prices in sympathy with the domestic coals and inasmuch as the basic prices of domestic coals have not been increased it may be that the steam contracts will remain unchanged.

The prices for the month of March per gross ton of 2240 lb. for line shipment and f.o.b. Port Richmond for tide are as follows:

	Line	Tide		Line	Tide
Broken.....	\$5.90	\$6.05	Buckwheat..	\$3.15	\$3.75
Egg.....	4.80	6.00	Rice.....	2.65	3.65
Stove.....	5.05	6.35	Boiler.....	2.45	3.55
Nut.....	5.15	6.40	Barley.....	2.15	2.40
Pea.....	3.75	4.65			

Bituminous—There continues to be improvement in the situation, due principally to the almost ideal weather conditions, which have assisted the rail movement to a notable degree. This is not to be taken that conditions are normal, for such is not the case, as the shortage is still serious. Numerous plants continue to operate on restricted time and many of the essential industries are still compelled to depend upon the fuel administration to confiscate a considerable tonnage. There continues to be considerable rail congestion and this is particularly true west of Altoona, although eastward from there to this city the improvement has been quite pronounced. The movement of fuel from the southern fields via the Baltimore & Ohio R.R. is also on the mend.

The trade is quite gratified at the decision made by the Government to expend vast sums in the purchase of increased motive power for all the coal roads. If anything the greatest need of the industry has at all times been for more locomotives and the prompt repair of the large number that have been disabled.

Due to the very much unsettled conditions in the trade relating to the Government's control, practically no contract business is being done. As it now stands most interests take the stand that there is no particular advantage to be gained by entering into an agreement. On the part of the consumer, though, he feels that if he can negotiate a contract he will feel some assurance of getting a fairly regular supply. As it now stands he is compelled to plead with his old shippers to keep him supplied, but in the case where the operator is having his production deflected by priority orders the old customers are left out

in the cold. This is a condition that the operators themselves are chafing under, as we know of several companies who for the past several months on account of priority orders have not had more than a dozen cars of coal for customers of long standing.

BALTIMORE

Bituminous supply easier, but still apportioned to hard-pressed industries. Little anthracite arriving. Trade looks toward changes coming in April.

Bituminous—Ideal weather conditions for the railroads in this section have speeded up movement. While many mines are still complaining that they have not all the cars they could use by any means, there is no doubt that a great quantity of fuel is now afloat and that even easier conditions are assured for a time. Reports of coal between this point and the mines show that hundreds of cars are on sidings, in addition to those now moving. The coal coming here was readily absorbed, however, and there is still no spot market. As a matter of fact the urgent demand from certain factories is such that the Fuel Administrator is practically directing the distribution of all coal coming here to jobbers.

Anthracite—The trade, of course, generally discussed the 30c. reduction plan for domestic anthracite, and it is for the most part looked on as equitable. The idea of requiring consumers to file requests showing tonnage used, on hand, etc., was also generally approved. These were two of the recommendations of the national coal merchants group while in session here recently. Receipts of anthracite continue light as compared with demand. The approach of spring has lightened the call, as most of those without coal in their cellars have made up their minds to do without until the 30c. reduction plan is inaugurated in April. Even under careful handling of summer distribution the trade is skeptical of ability to furnish consumers with anything like full supply before the advent of next fall and winter.

Lake Markets

PITTSBURGH

Coal contracting awaits new prices. Some reservations made. New inspection system discussed. Car supplies increasing. Large consumers supplied with coal.

Making of coal contracts for the period beginning Apr. 1 naturally awaits the announcement of the Fuel Administration's plans. Never before has the contracting been so long delayed, but it is doubtful if there will be the usual volume of contracting when prices are set, as both producers and consumers are disposed to go slow. Informal understandings have been reached between producers and consumers in many cases that shipments are to continue as formerly, subject to the ruling Government price.

The expectation is still entertained in some quarters that if any considerable advance is made over the present set prices, based on \$2.45 for mine-run, there will be times when the open market for free coal will be below the Government limit. That, after all would only repeat the condition that has often obtained in spring and summer of prompt prices being below the contract level.

Local operators are much interested to see how the inspection system of the Fuel Administration will work out. Undoubtedly the district representatives of the Fuel Administration can find many men willing, or even anxious, to act as inspectors, but it is pointed out that the test of the inspector's ability is not clearly defined. All the operators express themselves as favorable to the elimination of slate and other refuse matter as a material to be carried by the railroads under the guise of "coal," as its elimination would increase the real capacity of the railroads; but none of the operators is willing individually to plead guilty to the charge of shipping 9 per cent. waste matter with his coal. The fact that inspection is at least a possibility may have a good moral influence at the mines.

Car supplies increased slightly last week, while this week opened with very good promise. There is little scarcity of coal in the immediate Pittsburgh district, and practically none at all in the Youngstown district, the large consumers in both districts being in fairly comfortable position as to coal. The steel mills are not running full, however, on account of difficulty

in shipping their product, and are therefore not consuming altogether normal tonnages of coal. Jobbers are still doing business, when opportunity offers, on the commission basis, but are doubtful what position the trade will accord them when the commission comes off Apr. 1, as an extra to be charged the ultimate buyer. The market remains quotable at the former set prices: Slack, \$2.20; mine-run, \$2.45; screened, \$2.70, per net ton at mine, Pittsburgh district, with 15c. extra permitted to be charged by brokers.

BUFFALO

Some car improvement. Bituminous in usual heavy demand. Anthracite not yet meeting wants of consumers. Interest in reports of price reduction.

Bituminous—The situation improves slowly, chiefly on account of the better movement of cars. If this improvement keeps up complaints will soon be over. Some jobbers are able to report good blocks of cars now and then, but not regularly.

There are predictions on the part of some shippers that the cars which have been frozen in all over the country will soon begin to move with a rush, in which case the coal supply will increase fast. It will be hard to get too much of this sort of thing, though, and if it does not go on very far the coal shortage will continue. The winter has apparently gone, so that the need of coal is less.

The uncertainty in the trade continues. Nobody knows what to look for next, and orders from Washington to report this or that phase of the trade are as numerous as ever. Oddly enough, the new zoning order does not make its appearance here, and the taking over of the railroads has not produced any visible change in the running of the roads. Shippers are puzzled.

It is anything but an easy matter to fix prices on bituminous coal, as the various rail rates and orders are complicating. Generally Buffalo pays \$4.60 for mine-run (thin-veined at the Pittsburgh rail rate) with 5 and 15c. less at the Bessemer and Allegheny Valley rates. The thick-vein prices are \$4.35 for three-quarter, \$4.15 for mine-run and \$3.90 for slack at the Pittsburgh rate, all per net ton, f.o.b. Buffalo.

Anthracite—The supply is not good. It seems that the shippers overdid the reduction of weather shipment which was instituted to meet the arrival of mild weather. No distress is possible now, but the supply in consumers' cellars is not increasing to any extent. At the same time many consumers are returning to the exclusive use of natural gas, which relieves the shippers to a great extent.

Shipping agents say that they have no coal to load for lake shipment and do not see how they are going to have any till the local demand is satisfied. Canadian retail dealers are still demanding coal as usual, on the plea that it is entirely lacking in many homes; but the shipments are such that this condition of things will slowly disappear.

DETROIT

Return of wintry temperature stimulates domestic demand. Receipts of bituminous maintain fair volume.

Bituminous—While in a general way the Detroit market presents an easier aspect because shipments are being maintained in fair volume, there is still no excess of supply arriving. The fact that weather conditions through the first week of March were characterized by springlike temperature permitted a considerable reduction in household consumption, thus increasing the supply of coal available for the use of steam plants.

Atmospheric conditions, however, have undergone a conspicuous change, and snow, blustering wind and low temperature have brought a revival of demand from household consumers, many of whom had allowed their supplies to dwindle away during the warmer weather. Records of the Detroit-Toledo railroads' operating committee indicate that shipments of bituminous coal coming into Detroit in the week ending Mar. 9 averaged slightly above 700 cars daily.

Apparently little attempt has yet been made by retail dealers or industrial concerns to begin stocking up reserves for later needs. It is said, in fact, that the quantity of coal coming into the city just about meets present requirements. Some of the jobbers are advising customers to get a reserve as large as possible during the present month, explaining that with the resumption of navigation on the lakes early in April the opportunity for stocking up will likely be much less favorable.

as cars now used in moving coal here may then be required in carrying it from mines to lake loading docks.

Uncertainty as to what prices may be put in effect after Apr. 1 is a deterrent factor as far as the retail dealers are concerned, as also is a statement credited to the Michigan fuel administrator that after Apr. 1, the maximum permissible margin ought to be not more than \$2 a ton.

Anthracite—Receipts of anthracite rather fall short of requirements. Practically all the stock now arriving is needed for immediate distribution to household consumers, and retailers are seemingly finding no opportunity to create reserve piles in their yards. With little or no coke available and not much smokeless bituminous in the market, the greater proportion of household users are endeavoring to get anthracite.

COLUMBUS

A much more easier feeling is shown in the coal trade in Ohio. Stocking by domestic users is not as active as might be expected although a considerable tonnage is being laid up for next winter.

The coal trade in Ohio shows a much more normal aspect in every way. With the passing of the low temperatures and the wonderful improvement in transportation facilities the coal situation is much easier and coal men generally now have time to cast around and predict the future of the trade. Steam business is still active, although stocking for that purpose is not frenzied. The opinion appears to prevail that there will be sufficient fuel in this section to take care of current needs for some time to come.

The domestic trade is still active as a large sprinkling of users are taking heed of advice and are stocking for the coming winter. Others are holding off in the belief that they will be able to get Pocahontas and other fancy grades later. There is a marked scarcity of the fancy grades on the local market, due largely to talk of instituting the zoning plan of distribution. But so many complaints have been received against the zoning plan that it is now the belief that Federal authorities will allow the domestic trade at least to develop along normal lines. Dealers are stocking up to a certain extent in anticipation of a better demand prior to the opening of the lake trade. Some of the most farsighted dealers are trying to get as much coal in their yards as possible, as it is believed an advance in price may be made. Wagons which have been used for coal delivery during the emergency of the winter are not now required. On the whole the domestic trade is practically normal as far as supply and demand goes.

The steam business is probably the most active department of the trade at this time. Steam consumers, especially those using the largest tonnage are stocking up as fast as possible and many have accumulated quite a surplus. Manufacturing plants are now completely supplied with fuel. The same is true of public utilities and all interurban lines. Curtailment of service upon the advice of the state fuel administration is still in vogue by public utilities. Some of the larger users are casting around for contracts as the time for contracting is now approaching. But contracts will not be nearly as numerous as in previous years. Railroads are still taking a large tonnage as their freight movement is still large.

The production in all Ohio districts has been gradually increased under the influence of a better car supply. The Hocking Valley is now almost up to capacity and the same is true of the Pomeroy Bend field. Massillon and Crooksville are producing about 75 to 80 per cent. of normal and quite a good increase is reported from eastern Ohio.

Prices of short tons f.o.b. mines are as follows:

	Hocking	Pomeroy	Eastern Ohio
Sized grades.....	\$2.70	\$3.05	\$2.70
Mine-run.....	2.45	2.70	2.45
Screenings.....	2.20	2.45	2.20

CINCINNATI

Demand continues to exceed supply in virtually all lines. Little spot coal available. Contract inquiry is heavy.

The continuation of moderate weather has to some extent caused a diminution of demand, especially from domestic consumers; but the total volume of demand is still much in excess of the available supply, as traffic conditions remain bad, and the car supply is far from up to normal.

Virtually all of the coal shipped is being delivered under old contracts, leaving the spot market bare of offerings, or very nearly so. What coal is available is moving at the prices fixed by the Government and is eagerly snapped up. Prospects are for the heaviest contract demand ever witnessed, as all consumers have fresh in their minds the scarcity of the past few months and are determined not to be caught short of coal again if they can help it. The trade will fix no prices in contracts, however, the general position being that as Government prices must necessarily prevail, subject to such subsequent action as the Federal authorities may see fit to take in the matter of prices, car supply, diversion of shipments and so forth there is no use in attempting to fix contract figures. The agreement will simply be to furnish a certain amount of a certain kind of coal, subject to existing and future Government regulations and to whatever other contingencies may arise to affect either price or the supply itself. The fact that consumers will readily accept contracts under such extremely indefinite conditions is a sufficient indication of the general anxiety to secure some guarantee of a fuel supply.

BIRMINGHAM

Domestic demand experiences a slowing up; steam market strong. Production better than last period though curtailed by irregular work and local strikes.

There has been a noticeable slackening up in the domestic demand during the past week, though inquiries continue fairly good. The easing up is due, presumably, to the anticipated new schedule of prices to be announced by the Fuel Administration, effective Apr. 1. It is learned that such schedules will carry some changes in the classification of mines, but further than this it is not known that there will be any revision in prices. It is stated that the mines in the Blue Creek district will be placed on the big seam basis, and other classification adjustments made.

Inquiries for steam coal show no diminution, and some mines producing the soft Cahaba domestic coal, which does not stock so well, have temporarily thrown their output on the steam market to help relieve the stress.

The output of coal in the Alabama field, while showing considerable improvement over a week ago, especially at the mines where differences existed with union labor, and where outputs are nearly normal again, is far below what it should be. Production at the mines of the commercial operators is reported as badly crippled by irregular work and labor shortage. A strike at the Piper mines of the Ivy Leaf and Piper Coal Co. closed that colliery down three days the past week and cut the production 50 per cent. or more.

An ample car supply is being furnished all mines in the district, no complaint being heard on this score.

Coke

CONNELLVILLE

Much better car supply this week but poor distribution as to consuming points, and competitive market possible in coke loaded in some cars. Labor supply regarded adequate for heavier shipments.

The opening of this week saw the largest car supply in the Connellsville region since last October, also the largest increase from one week to the next that has occurred for a long time. The improvement, assuming it to be lasting, is attributable partly to better movement of empties back from furnaces to ovens, the movement of loaded cars having greatly improved several weeks ago, and partly to the addition to the service of a number of cars released in the east by the clearing of the congestion there.

The Monongahela R.R., which is the governing factor, had an 80 per cent. car supply Monday of this week, with a promise of a 70 per cent. supply for Tuesday. Last week the average was only 43 per cent. while with such a start this week promises about 60 per cent. for an average. The increased car supply this week will help the coke operators more than the blast furnaces, for the reason that the supply of Peoria & Lake Erie cars is much better than that of Pennsylvania cars, and the former reach only a limited number of furnaces. Coke operators will have an opportunity to move a little of the coke they have been accumulating the past few weeks.

This may make a wide open market for coke in Peoria & Lake Erie cars, while coke loaded in Pennsylvania and Baltimore & Ohio cars may continue scarce. Market transactions of late have been confined almost entirely to Peoria & Lake Erie deliveries.

While there may be some difficulty in getting out full working forces this week to take care of the large increase in car supply, operators have no fear but that in the long run they will be able to produce and load all the coke the furnaces require, if only they are given the cars regularly.

Nothing specific has been heard as to progress in the movement to reform car distribution and make it in relation to the capacity of the individual coke works instead of, as for a long time past, in relation to the number of ovens in blast.

The market on the whole continues quiet, with only occasional sales of small lots. So far as known all transactions are at the set prices: Furnace, \$6; foundry, 72-hour selected, \$7; crushed, over 1-in., \$7.30, per net ton at ovens. So far as known no contracts expire this month, but the major portion of contracts now in operation will run out June 30.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Mar. 2 at 285,828 tons, an increase of 29,979 tons, and shipments at 297,234 tons, a decrease of 344 tons.

Buffalo—With the slight stir in bituminous coal the coke trade seems to take up all their time, so that nobody is able to report new business in coke. It remains undecided whether the consumers are going to be able to make their own deals with the ovens direct, as they did last year, and whether the price can be made without reference to the Government rules, as has been the case in general for the present contracting year. The supply to the furnaces remains adequate.

Birmingham—There is little change to be reported in the coke market. Inquiry is stiff and Government figures rule in the business booked. Both foundry and furnace coke supply is far short of requirements. Production is not up to capacity by any means, trouble in coal-mining circles causing a corresponding slump in the output. The problem of securing an adequate supply of furnace coke is becoming a serious problem with the iron-makers, and temporary banking of furnaces has been reported.

Middle Western

GENERAL REVIEW

Trade is delaying buying, waiting for the Government to announce some definite program.

All branches of the coal trade are fully cognizant of the fact that there are to be some changes in the program and have been patiently waiting for an announcement from Washington to outline a policy for the coming year. The trade is awaiting the Government's zoning policy before closing for next year's requirements with any jobber or producer. The fact that some trade papers have suggested there might be a reduction of prices for the early buyers is having its influence regardless of the disastrous results of such a policy last year.

The immediate coal situation is much relieved. The demand for domestic coal naturally slumps with the advance of warm weather. The dealer welcomes a let up in order that he may sum up his accomplishments for the past season and collect outstanding accounts, which have in some instances been neglected, because of the constant attention that was necessary to supply the trade with enough fuel to keep it warm. Many dealers say that a summary of their last year's business indicated a smaller percentage of outstanding accounts at this time than for any similar period for years. Transportation conditions are much improved as to movement. However, cars are still scarce and mines have not worked on an average to exceed 68 per cent. during the past week. The Chicago & Eastern Illinois, Burlington, Illinois Central and Missouri Pacific have all failed to provide sufficient cars to keep local mines in operation.

The receipts of steam coal have reached almost normal, and little or no trouble is expected in the need of western bituminous coal for the immediate future. Few contracts will be made until the Garfield policy is announced. Eastern bituminous and

hard coal is still scarce in the Middle West, dealers reporting that they are unable to buy hard coal for early delivery. This seems to be more than true with the dealers that have had no long-time connection with some firm that handles hard coal.

CHICAGO

Demand for steam good and market brisk. Domestic trade buying only the best grades.

There is still a market here for any grade that comes in. However, the lower grades are finding a market only with the steam user, and the better prepared high grade Illinois and Indiana coal is demanded by the domestic trade. Some few contracts have been closed, but with connections that have been intimate for years; in fact everyone seems to prefer to delay contract negotiations until some definite assurance is had that arrangements made will meet with the approval of the Federal Fuel Administration.

The receipts of eastern coal in this market are by no means normal, though much improved; in fact, more coal from the East is arriving than at any time since November, 1917.

Quotations in the Chicago market are as follows, per net ton f.o.b. cars at mines:

	Williamson and Franklin	Saline and Harrisburg	Fulton and Peoria	Springfield	Carterville	Grundy, LaSalle, Bureau and Will
Steam lump.....	\$2.65@2.80	\$2.65@2.80	\$3.00@3.15	\$2.65@2.80	\$2.65@2.80	\$3.35@3.50
Domestic lump.....	2.65@2.80	2.65@2.80	3.00@3.15	2.65@2.80	2.65@2.80	3.35@3.50
Egg or furnace.....	2.65@2.80	2.65@2.80	3.00@3.15	2.65@2.80	2.65@2.80	3.35@3.50
Small egg or nut.....	2.65@2.80	2.65@2.80	3.00@3.15	2.65@2.80	2.65@2.80	3.35@3.50
Stove.....	2.65@2.80	2.65@2.80	3.00@3.15	2.65@2.80	2.65@2.80	3.35@3.50
Chestnut.....	2.65@2.80	2.65@2.80	3.00@3.15	2.65@2.80	2.65@2.80	3.35@3.50
Pea.....	2.65@2.80	2.65@2.80	3.00@3.15	2.65@2.80	2.65@2.80	3.35@3.50
Washed egg.....	2.65@2.80	2.65@2.80			2.65@2.80	3.35@3.50
Washed stove.....	2.65@2.80	2.65@2.80			2.65@2.80	3.35@3.50
Washed nut.....	2.65@2.80	2.65@2.80			2.65@2.80	3.35@3.50
Mine-run.....	2.40@2.55	2.40@2.55	2.75@2.90	2.40@2.55	2.40@2.55	3.10@3.25
Screenings.....	2.15@2.30	2.15@2.30	2.50@2.65	2.15@2.30	2.15@2.30	2.85@3.00
Washed slack.....	2.15@2.30			2.15@2.30	2.15@2.30	2.85@3.00

	Clinton and Sullivan	Knox and Greene	Eastern Kentucky	Pocah. and W. Va.	Smokeless Penna.	Hocking	West Va. Splint
Dom. lump.....	\$2.65@2.80	\$2.65@2.80	\$3.10@3.25	\$2.60@2.75	\$2.70@2.85	\$3.05@3.20	\$2.85@3.00
Steam lump.....	2.65@2.80	2.65@2.80	3.10@3.25	2.60@2.75	2.70@2.85	3.05@3.20	2.85@3.00
Egg.....	2.65@2.80	2.65@2.80	3.10@3.25	2.60@2.75	2.70@2.85	3.05@3.20	2.85@3.00
Small egg or nut.....	2.65@2.80	2.65@2.80	3.10@3.25	2.60@2.75	2.70@2.85	3.05@3.20	2.85@3.00
Mine-run.....	2.40@2.55	2.40@2.55	2.85@3.00	2.45@2.60	2.45@2.60	2.70@2.85	2.60@2.75
Screenings.....	2.15@2.30	2.15@2.30	2.60@2.75	2.10@2.25	2.10@2.25	2.55@2.70	2.35@2.50

MILWAUKEE

Chestnut anthracite sold out in city and state. Plenty of egg and buckwheat, and also of coke. Plans made to check coal hoarding.

The announcement by the Federal Fuel Administration that anthracite coal would be cut 30c. per ton between Apr. 1 and Sept. 1 has served to check immediate buying to some extent, but it is expected that the advent of April will witness a rush on the part of householders to stock up their bins. At present there is an ample supply of egg and buckwheat anthracite, but chestnut is not to be had. The same is true at points in the interior of the state. Coke is easily obtainable. There is some uneasiness over a report that there will be no chestnut the coming season. State Fuel Administrator W. N. Fitzgerald has given notice that any attempts to hoard coal beyond estimated needs will meet with severe treatment.

W. H. Groverman, of Minneapolis, will supervise coal docks on Lake Superior and the west shore of Lake Michigan the coming season, but his authority does not affect that of the state fuel administration's.

ST. LOUIS

Spring weather has taken all the life out of the local market. Railroad conditions have helped it some, but in a general way the market is loaded with coal and the demand exceedingly light, with no outside coals coming in. Steam demand easy. Car service bad and movement slow.

The local condition is now worrying the shipper more than it is the consumer. During the past two weeks everybody has filled up to storage capacity with both steam and domestic coal, with the result that the demand is practically nothing.

There seems to be an effort on the part of some of the large buyers to hold off buying right now in an effort to break the market. The latter part of the week there were rumors that the prices had been cut under the \$2.65 price in some instances, but this could not be confirmed. The situation, however, is a bad one, for several of the mines have had coal left over unbilled.

The L. & N. R.R. still has an embargo on Chicago and that has filled the local market with the output of the mines on that road. The ferry of the Illinois Southern R.R. at St. Genevieve went out of commission last week, shutting off the gateway to southeast Missouri and the Lead Belt, with the result that an additional tonnage was thrown in here.

The Illinois Central, however, has been running about two to three days a week with a scant supply of cars, and the same condition is to some extent true of the M. & O. and L. & N. The Iron Mountain R.R. is perhaps as bad, if not worse. The movement on most of these roads is exceedingly poor. For the first time in many months the Terminal situation is practically normal, and cars locally are beginning to move in somewhat reasonable time.

In the Carterville field working conditions are improved, but not as they should be, on account of the poor car supply afforded by the Iron Mountain and Illinois Central. The Chicago & East Illinois has somewhat better service and the Burlington is doing remarkably well. The greater portion of this coal is still going for railroad purposes, and the Government orders have let up some, but no coal to speak of

During the past couple of weeks there have been some contracts made by operators for a maximum and minimum tonnage of either lump, egg or nut, as the operator may choose, and in the event that he cannot get it, mine-run at the Government price prevailing at time of shipment, with a stipulation to the effect that if there is any increase it shall be added. The contract is just a mere form of protection for the buyer, he having the assurance that he will have some regular source of supply.

The local market is per net ton f.o.b. mine:

	Williamson and Franklin County	Mt. Olive and Staunton	Standard
6-in. lump.....	\$2.65@2.80	\$2.65@2.80	\$2.65@2.80
3x6-in. egg.....	2.65@2.80	2.65@2.80	2.65@2.80
2x3-in. nut.....	2.65@2.80	2.65@2.80	2.65@2.80
No. 2 nut.....	2.65@2.80		
No. 3 nut.....	2.65@2.80		
No. 4 nut.....	2.65@2.80		
No. 5 nut.....	2.15@2.30		
2-in. sergs.....	2.15@2.30	2.15@2.30	2.15@2.30
2-in. lump.....			2.65@2.80
3-in. lump.....		2.65@2.80	
Steam egg.....	2.65@2.80	2.65@2.80	2.65@2.80
Mine-run.....	2.40@2.55	2.40@2.55	2.40@2.55

Washed:

No. 1.....	\$2.65@2.80	\$2.65@2.80
No. 2.....	2.65@2.80	2.65@2.80
No. 3.....	2.65@2.80	2.65@2.80
No. 4.....	2.65@2.80	2.65@2.80
No. 5.....	2.15@2.30	2.15@2.30

Williamson & Franklin Co. rate is 87½c. Other fields 72½c.

SEATTLE

Washington coal to be reclassified with maximum price fixed for every grade and preparation. Some prices to be lowered, others raised.

The coals of Washington will be completely reclassified and maximum prices fixed for every grade and preparation of coal produced by the mines if recommendations forwarded to Washington by David Whitcomb, state fuel administrator, are accepted by the national fuel administrator. The recommendations are based upon the report of the mine price board, which spent six weeks in formulating the new classification and new prices. The exact prices will not be given out until a decision in the matter is made by the national head of the Fuel Administration, but it is known that some radical changes in prices, some increased and some decreased, have been asked. The figures are based on an accurate tabulation and knowledge of minimum costs in the various fields of the state. Sizes and the composition of mixtures have been taken into consideration so that all classes of coal will have a definite price hereafter.

General Statistics

BALTIMORE & OHIO

The following is statement of the coal and coke tonnage moved over the Baltimore & Ohio system and affiliated lines during the month of December, 1917, as compared with the corresponding month of the previous year:

	Tons, 1917	Tons, 1916
Coal.....	2,911,244	2,749,964
Coke.....	231,032	309,791
Total.....	3,142,276	3,059,755

ANTHRACITE SHIPMENTS FOR FEBRUARY, 1918

The shipments by carrier companies in February, 1917, and 1918, and for the coal year to date, were as follows:

	February, 1918	February, 1917	Coal Year, 1917-1918	Coal Year, 1916-1917
P. & R. R. W.....	1,107,982	966,725	13,459,445	11,541,178
L. V. R.R.....	1,042,784	909,704	12,865,850	10,934,270
C. R. R. of N. J.....	638,557	536,023	7,598,756	6,485,736
D. L. & W. R.R.....	997,550	901,098	11,372,936	9,776,614
D. & H. Co.....	600,799	482,638	7,892,860	6,518,233
Penna. R.R.....	459,271	428,230	5,123,695	5,001,516
Erie R.R.....	614,210	637,325	7,975,611	6,930,053
N. Y. O. & W. R. W.....	177,047	143,711	1,863,356	1,739,542
L. & N. E. R.R.....	286,147	225,944	3,670,561	2,535,179
	5,924,347	5,231,398	71,825,270	61,462,321
* Deduction.....	* 112,265	* 52,966	* 1,349,732	* 674,807
	5,812,082	5,178,432	70,475,538	60,787,514

* Deduction: Tonnage reported by both C. R. R. of N. J. and L. & N. E. R. R.